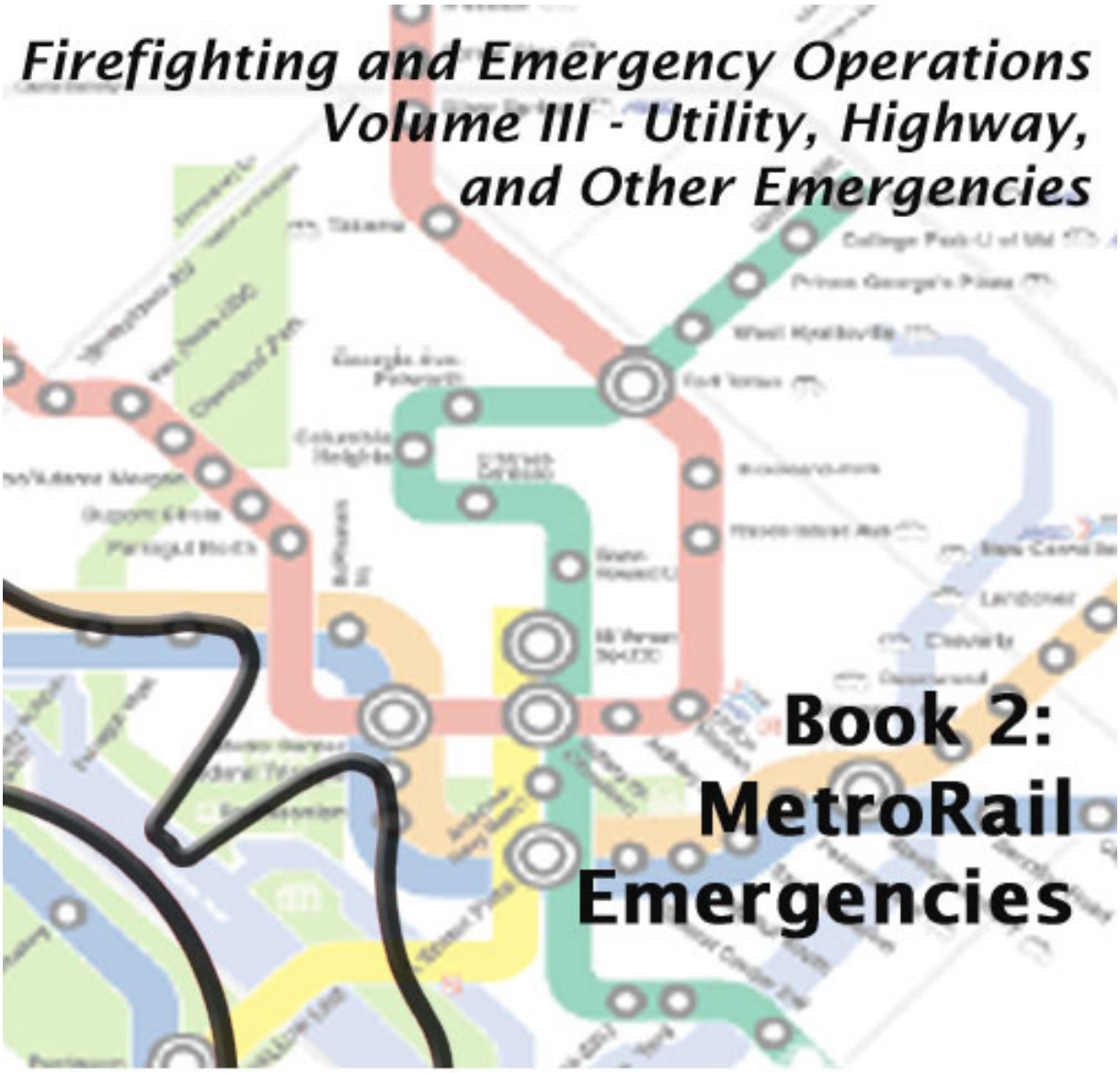
Firefighting and Emergency Operations Volume III - Utility, Highway, and Other Emergencies



Book 2: MetroRail Emergencies

Fire and Rescue Departments of Northern Virginia

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- Arlington County
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TABLE OF CONTENTS

Appendices

PREFACE

This manual is designed for use as a resource and reference for all fire department personnel in Northern Virginia for response to emergencies involving Metrorail.

The Washington Metropolitan Area Transit Authority (WMATA/Metro) operates an electrified multi-track enclosed railroad throughout the Washington Metropolitan Area. This system uses transit vehicles that derive their propulsion power from an energized third rail. For comparison purposes, the Metro system is considered to be a light rail system. The only equipment that travels on Metro's tracks is Metro's transit trains and non-revenue and service equipment. Although Metro shares common corridors with other transportation systems, no other rail system utilizes Metro's tracks. The daily passenger load for the system fluctuates greatly. However, the Metro system has enjoyed steady patron growth since it opened in 1974. This increase in passenger load presents the potential for a catastrophic event.

This manual will describe the Metro system in-depth with an emphasis on fire and rescue response to events. All personnel must strive to remain familiar with all components of the system, realizing that at any time, any unit could be dispatched to mitigate a fire or EMS incident at Metro. Parking structures at Metro facilities are outside the scope of this manual. This manual is designed to be the operational companion to the Metrorail Emergency Services Manual.

The objectives of this manual are:

- To describe the Metro system found in Northern Virginia.
- To make known the features, problems, and precautions related to fighting fires, making rescues, and handling EMS incidents in the system.
- To establish general tactics for operations at such incidents.
- To reduce injuries, loss of life, and property.
- To establish standardized operational procedures for Metrorail incidents.

This manual is reviewed 90 days following initial implementation and then every three years following final implementation.

SYSTEM DESCRIPTION

The Metro system in Northern Virginia consists of three lines: Blue, Yellow, and Orange Lines. All three lines terminate in Fairfax County. There are a total of twenty stations within Northern Virginia: nine surface, eight subsurface, two aerial, and one which has the features of all three types. There are two Service and Inspection Yards, one at West Falls Church and the other at Eisenhower. Figure 1 shows an overview of the entire Metro system.

Figure 1 – Overview of Metro system.

The Huntington Station is a one-of-a-kind station within the Metro system. Trains enter the station on an aerial structure, go to a surface portion, and terminate in a tunnel. The aerial structure between the Eisenhower Avenue and Huntington Stations is one of the tallest and longest in the Metro system. Access to this structure is obtained primarily from either station.

The tail track at Huntington is located in the tunnel and can house 16 rail cars. Franconia-Springfield is the terminating station on the Blue Line. Beyond this station is a miniature yard. There are three tracks capable of housing up to 24 rail cars. The Blue Line is in a common corridor with the CSXT Railroad. Access to the Eisenhower Service and Inspection Yard is from the Blue line midway between the C/J Junction and the Van Dorn Station.

The surface portion of the Orange Line is in a common transportation corridor with Interstate Route 66, occupying the center median. The West Falls Church Service and Inspection Yard are accessed by a non-revenue tunnel from the west-end of the West Falls Church Station. This yard is in a community on the north side of Interstate Route 66 with vehicular access from that community. The facilities located in these yards include the Service and Inspection Building, TPSS and TB, Yard Operations, Plant Maintenance, Fueling Facility (automotive), and Train Control Facility.

The Yard Control Tower and Communications buildings are located within the Service and Inspection Building. Other facilities in this yard include underground fuel storage for backup generators, salt/sand dome, and motor vehicle fluid storage. The tail tracks are only used to store trains during revenue service hours. No overnight storage of trains occurs outside of the yards.

RAIL CARS

The rail cars used by Metro are manufactured by three firms and are identified by series number. The Rohr Corporation of California manufactured the 1000 and 8000 series. The 8000 series are identical to the 1000 series with the exception that they are modified for revenue handling and are not used for patron transport. The 2000, 3000, and 4000 series are manufactured by Breda Construzione of Italy. CAF/AAI, a joint Spanish and American consortium manufactures the 5000 series. Outwardly, all cars appear identical. The differences are primarily within the propulsion systems and interior components and features.

Figure 2

Construction

Each rail car is 75 feet in length, 10 feet wide, and 10 feet 10 inches in height. The weight is from 36 to 40 tons per car. The rail cars operate in a “married pair” configuration; they are semi-permanently coupled together. The smallest number of rail cars operating in the Metro system is two. This combination is 150 feet in length. The cars are identified as either an “A” or “B” car. The “A” car carries an even number (2004), while the “B” car caries an odd number (2005).

The maximum number of cars in a consist will be 8 (four pair) due to the maximum length of the station platform which is 600 feet.

Each rail car is constructed similar to most automobiles, with no frame. The car body acts as a box girder to resist stresses. The exterior walls are of ¼-inch aluminum extrusions. The cab ends are fiberglass caps covering two sets of collision posts, one on each side of the bulkhead door and one on each corner. The roof is fabricated of welded aluminum extrusions extending the full length of the car and is supported by aluminum cross members every 30 inches. The flooring is a sandwich consisting of two sheets of stainless steel with ¾-inch plywood and fiberglass insulation in between.

Doors

Each rail car has 14 door panels. The bulkhead doors, the end doors that are not used for revenue (entry and exit of passengers), are not numbered. These doors can be used for emergency access and egress. All bulkhead doors open inward. The doors between cars are not locked during revenue service; the end doors are locked during revenue service and can be opened by using the "XX" barrel key (soda machine type) on the Metro key ring, Figure 3. It is also necessary to ensure that the top and bottom deadbolt door handles are in the vertical position.

Figure 3 – Keys for opening end doors.

Each side door panel is numbered (1 through 12), Figure 4. Door panels on the operator cab side are numbered 1 through 6, starting directly behind the operator's cab. On the opposite side, the doors are numbered 7 through 12. The doors are made of thin aluminum and have a window gasket similar to that of the side windows of the rail car. The side door windows are a polycarbonate/safety glass combination.

If there is a dire emergency to remove a door window for ventilation, the door can be struck at the lower edge of the window with a heavy striking tool. This procedure is not recommended due to the inability to control the direction that the window will travel. The bulkhead door windows cannot be removed in this fashion.

The door opening control is located in the operator's cab. This switch will open all doors on that side of the car. When opening the doors by this switch, the train must be at the station platform and the third rail must be energized. Doors numbered 2, 8, and 9 can be opened from the outside with the use of the "XX" barrel key on the Metro key ring. Passengers and emergency crews have the ability to open the center doors (#’s 3, 4, 9, and 10) by using the manual pull handles.

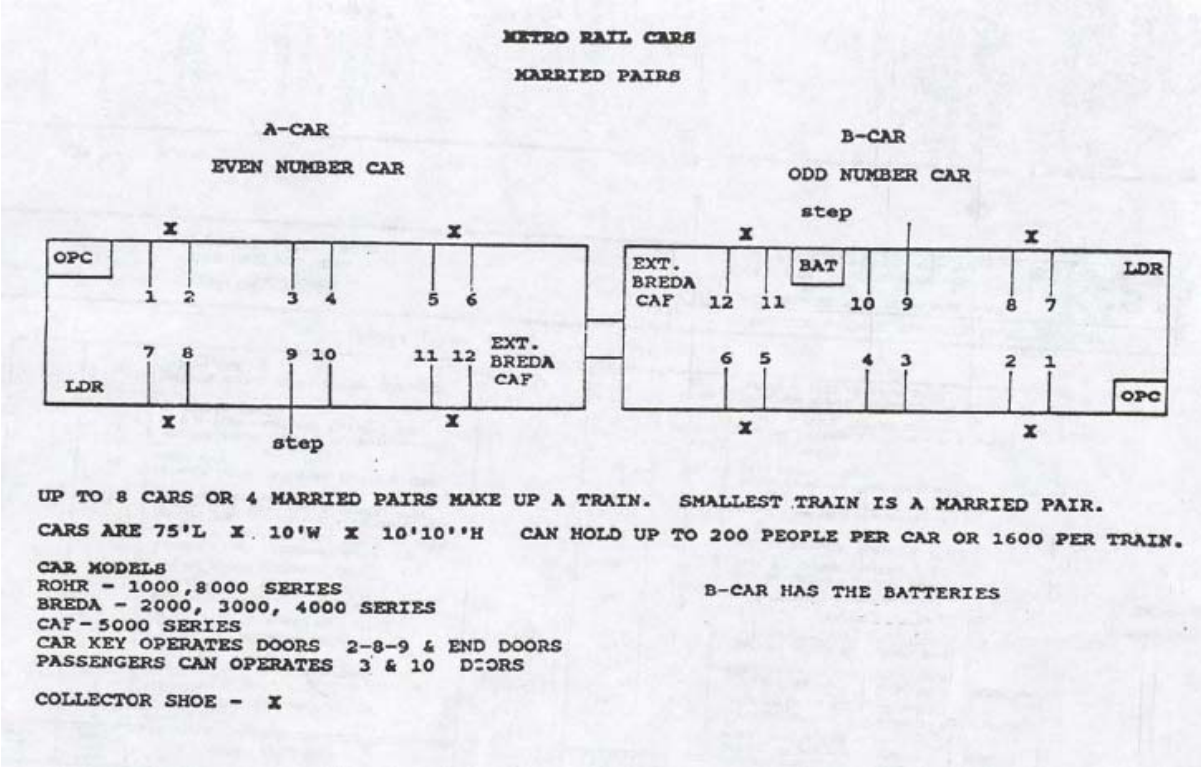

Figure 4 – Door diagram.

To activate these emergency door openers, the train must be at a complete stop. Lift the sealed cover panel next to the door to expose the pull handle. Pulling the handle down releases the sliding door panel on that side. The door must then be pushed to the fully open position. Do not open the doors on the third rail side with passengers on board the train.

Windows

The rail car side windows are a combination of safety glass on the exterior and polycarbonate on the interior. With the exception of the operator cab windows, the windows on Metro's rail cars do not open.

The side windows used in the Rohr cars are set in a metal frame; Breda and CAF/AAI do not use a metal frame. All windows are held in place with a rubber zip strip that can be removed from the inside of the passenger compartment. If access is required through a window, the zip strip must be removed. The seam in the zip strip must be located; it is usually near the seat handrail, on top or bottom of the window. A flat blade screw driver or knife must be inserted into the seam to start the removal of the zip strip. Peel the

Figure 5 – Removing the zip strip.

zip strip completely around the window. Once the zip strip has been removed, the window must be pushed into the car. Figure 5 shows the removal of the zip strip.

The operator's cab window, which is accessed by the barrel 'XX' key from the inside of the rail car, opens to allow the operator to observe the side of the train while at the platform.

The windows on the bulkhead ends of the rail cars are made of laminated safety glass. The windows on the passenger doors are a polycarbonate/safety glass combination. These windows are set in a rubber zip strip gasket. If absolutely necessary, the operator's compartment and the side door windows can be forcibly removed with the use of a heavy striking tool.

Electrical Systems

The WMATA passenger rail cars are electrically driven vehicles. Electricity is delivered to the rail car by collector shoes located at the center of each truck on both sides (under the front and rear side revenue doors). When any one collector shoe is in contact with an energized third rail, all four collector shoes on that car are energized.

The rail cars either transfer the third rail power to the traction power motors as DC current or convert it to AC current and then transfer it to the traction power motors. The 1000, 5000, and 8000 series cars have AC power traction motors; the 2000, 3000, and 4000 series have DC power motors. The 2000 series cars are being retrofitted to mirror the systems of the 1000 series. The 750 volts is used to power all on-board electrical systems including passenger comfort and braking, as well as charging the back-up battery system. The return-side and ground of the electrical system is the running wheels.

The only systems that use 750 volts above the floor are the heater strips that run along the wall at the floor level on both sides of the car and the air conditioning systems that are located above the ceiling at both ends of the rail cars. All other systems inside of the cars use 37.5 volts. The 750-volt current **does not** pass from one rail car to another; the 37.5-volt system **does** pass from one car to the next.

The CAF/AAI 5000 series cars have 230 volts that pass from the 'A' car to the 'B' car, but not from one pair to the next.

All of Metro's rail cars utilize dynamic braking to reduce the speed of the cars. This dynamic braking system reverses the polarity in the drive motors, turning them into generators. The electrical energy that is produced is directed to capacitors and/or resistor grids depending on the series of the rail car. The Breda 2000 series rail cars have an extensive resistor grid system. The Breda 2000 series dynamic breaking system sends all electrical power to the resistor grids to be dissipated off as thermal heat.

The other series rail cars store some excess energy developed by the dynamic braking system in capacitors; the remainder is sent to the resistor grids. The capacitors store this energy to assist with take-off propulsion. The resistor grids can be thermally (800 degrees F.) and electrically (up to 700 volts) hot.

The vast majority of electrical wiring is located in troughs on the underside of the rail cars. There is however, a significant amount of electrical wiring running through the walls and ceiling of all rail cars.

Fire Protection

Each rail car is equipped with portable fire extinguishers. The fire extinguishers are ABC Dry Chemical with a rating of 4A-60BC. On the 1000, 2000, and 8000 series cars, a single extinguisher is located in the operator's cab. The 3000, 4000, and 5000 series cars have two extinguishers each, one in the operators cab and the other under the last seat, opposite the operators cab near the rear bulkhead door where the A and B car are coupled. The interior finishes of the rail cars are of non-flammable materials.

Communications Systems

All rail cars have two communications systems, an internal intercom and a Metro radio. The intercom system has a microphone-speaker unit at each bulkhead door. Depressing the microphone button and releasing it operates the intercom, and calls the operator's cab. This system allows communication between any car in the consist and the lead car operator's cab. Fire and rescue personnel can use this system to relay information to passengers or crews operating on the train.

When in the operator's cab, you can use either system. The communications selector dial in the operator's cab must be aligned for either the radio or intercom. When in the intercom position, the operator can communicate with all cars in the consist. The radio position allows direct communications to OCC and others that have Metro radios. However, since Metro's radio procedures are different from the fire departments, it is suggested that a Metro employee operate it. Both systems operate when the rail car in contact with energized third rail or as long as the back-up batteries are charged.

Emergency Access/Egress

Emergency access and egress may be gained through the side doors, the bulkhead doors, or the windows. Doors number 2, 8, and 9 can be opened from the outside with the use of the "XX" barrel key on the Metro key ring, provided that the car is in contact with energized third rail or the batteries are charged. The bulkhead doors, which are not used for revenue (entry and exit of passengers), can be used for emergency access and egress. All bulkhead doors open inward.

The doors between cars are not locked during revenue service; the end doors are locked during revenue service and can be opened by using the "XX" barrel key on the Metro key ring. The bulkhead doors are non-electric and can be opened regardless of the power status of the rail car. It is also necessary to ensure that the top and bottom deadbolt door handles are in the vertical position. The doors between the married pair (A and B car) can be used for access if a crewmember is small enough to access the space between the cars.

All windows are held in place with a rubber zip strip that can be removed from the inside of the passenger compartment. If access is required through a window, the zip strip must be removed. Once the zip strip has been removed, the window must be pushed into the car.

The windows on the bulkhead ends of the rail cars are made of laminated safety glass. The windows on the passenger doors are a polycarbonate/safety glass combination. These windows are set in a rubber zip strip gasket. If absolutely necessary, the operator's compartment and the side door windows can be forcibly removed with the use of a heavy striking tool.

The emergency ladder is either in a compartment opposite the operator's cab or under the first side-facing seat opposite the operator's cab (Rohr cars only). This ladder hooks into the anti-climb plate at the front of each rail car. The ladder is absolutely needed if evacuating the train through the bulkhead doors.

STATIONS

There are three types of stations in the system: aerial or elevated, surface or at-grade, and sub-surface or underground. The station type is determined by the platform's location compared to adjacent road surfaces. Huntington is a variation on this design because it is built into the side of a hill; it starts as an aerial station, goes to a surface station, and ends in a tunnel as a sub-surface station. An example of a station is shown in Figure 6.

Station platforms are side load platform-center track, center load platform-side track, split platform-multiple level, or a combination. At side-loading platforms, the platform is adjacent to wall or outer edge of the train room, the tracks are in the center, and there is no direct access to the opposite platform. At center platform, the tracks are on the outer edges of the train room. This design allows direct access to trains on either track.

Split-level platforms have platforms on different levels. Two stations have a third track within the platform area. This third track, known as a pocket track, can be used as revenue, turn around, or yard lead track. There is no direct access from one platform to the other. The West Falls Church and National Airport Stations vary from this by having a pocket track within the station. In the pocket track, the third rail is adjacent to one platform.

Figure 6 – A Metrorail station.

Station Construction

Each station is approximately 60 feet wide with platform(s) 600 feet long. The width of aerial stations may be considerably less. The stations vary in height from 30 to 35 feet above the track. The design of the stations requires that patrons enter through a mezzanine and then either ascend or descend to the platform. Stations are built of concrete with clay tile floors. The central focal point of every station is the Kiosk. This room, in which the station manager operates, is located at the fare gates. The Kiosk is the control point for the station. It houses the station's communications equipment, elevator, and escalator monitoring panels, station fire maps, fire and intrusion alarm panels, and closed circuit TV monitors. For many incidents, this is the ideal location for incident command.

Some Metro stations will have more than one Kiosk, one of which will be designated as the main Kiosk. The Kiosk on the Huntington Avenue side of the Huntington Station is that station's main Kiosk.

Electrical. The Metrorail system has three distinct types of electrical systems: traction power, AC power, and battery power. The traction power system conducts electrical power to propel the rail cars. Traction power is covered in more detail later in this manual. The AC power system provides the electrical power to run lighting, ventilation, and any other systems not directly involved in propelling the rail cars. Battery power is found wherever emergency lighting is needed and also for the communications systems for continued operations when normal power is interrupted.

The AC power is provided to the stations at the AC switchboard room(s). The AC switchboard provides all power to the station, tunnels, and charges the back up batteries. Power is supplied to the AC switchboard by dual feeds at either 13,800 volts (PEPCO) or 34,500 volts (Dominion Virginia Power). The AC switchboard room access is restricted. Fire and rescue personnel must contact Metro for access even in the event of an emergency.

Emergency Power. The battery room has backup batteries that power limited functions within the stations and tunnels if the main power is interrupted. These functions include emergency lighting in the station and tunnels, communications equipment, and train control systems. The emergency lighting is 25% of the normal lighting in the station and every fourth light in the tunnel. The back-up batteries do not provide power to the electrical outlets in the tunnels.

Fire Protection

The Metro passenger stations are constructed of non-combustible materials with a fire rating of at least two hours. The interior finish of all public areas is of Class-A materials that will not continue to propagate fire spread. All stations are equipped with both manual and automatic fire protection systems. Each room is also equipped with two types of detectors. The fire and intrusion alarm panel located in the Kiosk monitors the fire protection systems.

Figure 7 – Examples of manual fire protection system equipment at Metrorail stations.

Manual Systems. Portable fire extinguishers are located in the fire equipment cabinets, every room in the station, in the Kiosk, along the tunnel walls, and in all ancillary buildings. In some locations, Halon 1211 extinguishers are staged. Every station and underground portion of the revenue right-of-way, excluding the Rhode Island Avenue Station in DC, is equipped with a standpipe system. This system services the station as well as the platform. Every station standpipe connection has an ID plate that identifies the shaft number, the maximum vertical drop, and the maximum horizontal run of the piping. This information will permit the pump operator to correctly supply the system.

All subsurface station standpipes except Huntington are wet systems; surface, tunnel and aerial systems are dry pipe. With the exception of the Huntington Station, the station and tunnel systems are not connected. The hose valves are located at 200-foot intervals in the tunnels and under the station platforms. There are additional hose valves in various locations within the system. There is at least one fire equipment cabinet on each station platform and additional cabinets in various locations within the station. These cabinets are equipped with two 4A: 40BC fire extinguishers and one fire department standpipe connection.

Automatic Systems. The automatic systems (sprinklers, Halon, FM 200) are found throughout Metro's facilities. These automatic systems are used in service areas, escalator pans, computer and electrical rooms, and in maintenance supply rooms.

The Halon and FM200 systems are used to protect sensitive equipment that would be damaged by ordinary fire suppression methods. The most common applications are AC switchboard rooms, DC tiebreaker and traction power rooms, communications rooms, battery charging rooms, and computer rooms. Respiratory protection is mandated to enter rooms that have had a discharge of these halogenated agents.

The Metro system is equipped with two types of sprinkler systems, wet pipe and deluge. The wet pipe systems are in heated rooms within the stations, ancillary buildings, and service facilities. The deluge systems are installed in the escalator pans of single entry stations, below the support truss of the escalator, between the surface and the mezzanine. This system is controlled by

ionization type smoke detectors located at the top and bottom of the escalator well ways. These escalators have sprinkler heads every fifty feet.

Automatic Public Address Announcement System (APAAS)

The Automatic Public Address Announcement System works within the station fire alarm system. When a fire alarm is received from a zone in the station, the APAAS system activates to provide the station manager with a pre-alert of a fire alarm that needs attention. The manager has two minutes to react to the alarm. During this time, a chime tone activates for 90 seconds. A reset attempt occurs for 10 seconds. If the reset is successful, the chime stops and the APAAS returns to the inactive status. If the reset fails the chimes will continue for another 20 seconds. After this timeframe, if the alarm remains active, the station entrance inbound escalators will stop and an announcement of the fire alarm will begin over the station public address system.

Ventilation Systems

There are two distinct conditions for the ventilation systems in the tunnels and underground stations: normal and emergency. The normal ventilation results from train movement in the tunnels and the use of mechanical fans to assist fresh air exchange during operations. Ventilation during emergency conditions is accomplished mechanically, Figure 8. The fans are either in the supply mode or exhaust mode, depending upon need. The primary function of the emergency system is to limit, or exclude passengers and fire and rescue personnel from exposure to heat and smoke.

Figure 8 – Ventilation equipment.

Normal Mode, Tunnel. The primary method of air exchange in the tunnels is the movement of trains through the tunnels. As a train moves forward, it forces air head of it and draws air in behind it. This is known as the piston effect. As the train approaches the station, vent shafts allow the air to be moved up and out of the system. This prevents a blast of air from buffeting passengers awaiting the trains and exhausts 'bad' air to the outside. As a train passes a vent shaft, it draws in fresh air behind it, completing the air exchange cycle. Vent shafts contain thermostatically controlled louvers and fans that allow air movement. These work in conjunction with emergency ventilation fans in case of a fire.

Emergency Mode, Tunnel. Emergency ventilation fan shafts have been installed to assist in the movement of smoke and air underground. The fans can be locally or remotely operated and are reversible. In an emergency, after contacting OCC, the fire and rescue Incident Commander assumes control of the fans. In the initial stages of an incident, prior to the arrival of fire and rescue units, OCC will begin operation of the fans in the direction deemed most appropriate for conditions reported. Each fan shaft contains a control box with four settings: Emergency Exhaust, Emergency Supply, Automatic Operation, and Off. Some of the older fans do not have an off mode. At the conclusion of all incidents, **all** fans shall be returned to the automatic mode.

The controls for the fans are electric/pneumatic. When activation is requested, it normally takes 40 to 60 seconds for the fans to start. Since OCC controls the fans from their computer screens, it may be necessary for fire and rescue personnel to confirm the operation and direction of the fans with them.

Normal Mode, Station. In underground stations, the under-platform ventilation system assists in the air exchange by using fans to draw air from under the trains and exhaust it away from the platforms, in order to divert hot bursts of air away from passengers as they board trains. The fans are also capable of supplying fresh air under the trains or into the station if necessary. The under-platform system works in conjunction with the dome vent fans to regulate the temperature within the station.

With the exception of five underground stations in DC, the under-platform ventilation system fans can be placed in the supply or exhaust mode. The systems have two control boxes, each controlling half of the fans. The mode switch has four settings: Emergency Exhaust, Emergency Supply, Automatic Operation, and Off. Not all of the boxes have an off setting. If fire and rescue personnel are going to operate the fans in the manual mode, they must contact OCC and return the fans to the automatic mode at the conclusion of the incident.

Emergency Mode, Station. During emergencies, the station ventilation fans can be used to supply fresh air or exhaust the products of combustion. The station dome fans can be use to exhaust smoke. OCC will react to the report of a fire at the platform level by activating ventilation fans in the exhaust mode to clear an evacuation path for passengers by bringing in air through the escalator way and forcing smoke into the tunnel. If a fire is reported at the mezzanine level, OCC will activate the station fans in the supply mode and force smoke out of the station and away from evacuation routes.

Ancillary Buildings

The ancillary buildings in the Metro system include Traction Power Substations (TPSS), Tie Breaker Buildings, and Chiller Plants.

These buildings have specialized functions that assist in the day-to-day operation of the system. Some of these buildings are located remote from a station, while others are located within the station proper. It is the function of the building that determines where it is located.

Chiller plants are located within or near underground stations. Traction power substations and tiebreaker stations are located approximately every one half mile along the right-of-way. Later sections in this manual contain more information on TPSS and TB rooms.

Communications

All stations are equipped with a public address system that can be used by OCC or the station manager. In emergencies, information can be given to passengers to direct them to safety. The microphone for the station PA system is in the Kiosk. Fire and rescue personnel can provide directions from this location as well as use this system to provide information to crews working in the station.

Passenger Emergency Reporting System (PERS). The Passenger Emergency Reporting System (PERS) is located on pylons or stanchions throughout all stations. By depressing the talk button, patrons can communicate with the station manager in the Kiosk to report emergencies and hazardous conditions or to seek assistance. Fire and rescue personnel can use the PERS to communicate with the Kiosk.

Emergency Access/Egress

All Metro stations are equipped with Knox Rapid Entry Key Boxes. The Knox boxes are located on the first flat wall to the right of the main entrance after the entry gate, Figure 9.

Figure 9 – Knox Box at Metro station entryway.

Those stations that do not have a flat wall in this area will have Knox boxes located in sight of the main gate in the same area. The stations that have multiple entrances remote from each other or border multiple jurisdictions will have multiple Knox boxes. The boxes contain the keys for all rooms within the station that fire and rescue personnel would normally have access to.

Those rooms that have restricted access still require a Metro official to open. These Knox Boxes can be used during revenue and non-revenue hours. During non-revenue hours, the main station gate is locked. Fire and rescue units must access the gate via key or if the key is not available, personnel may cut the chain at the link closest to the lock. **Do not cut the lock**. Access can also be gained at surface stations by opening the R.O.W. Gate at the end of the station platform. Extreme caution must be exercised with this procedure as the third rail may be directly below this gate.

People Movement

There are two means to evacuate every station: the entrance escalators or rail cars. In an emergency, subsurface stations can be evacuated via the emergency exit shaft or the vent shaft. The emergency exit shaft will have stairs that will lead to the surface or refuge area, while the vent shaft will have a ladder to the surface or refuge area.

Escalators. If the fire alarm goes into full activation, the inbound entrance escalators automatically stop; the outbound continue to run. The inbound escalators should be left in the stopped position so that fire and rescue personnel may access the station.

Elevators. The elevators are primarily intended for the movement of handicapped persons from the street level to the mezzanine and then to the platform level. The depth of the Forest Glen Station precludes the use of escalators; therefore, all patrons must use the elevators. With the exception of the Forest Glen Station in Montgomery County, elevators shall not be used to evacuate a station with smoke or fire conditions. All elevators are monitored in the Kiosk. The elevator control panel displays the direction, position, and status of each elevator individually.

Unlike elevators in most occupancies, those in Metro can be drifted to a landing to allow those stuck inside to be freed.

Inclinator. The south end of the Huntington Station is built into the side of a hill and is not capable of elevator access to the platform. This end of the station is equipped with an inclinator. This inclinator operates the same as an elevator except that it travels on an angle. This unit has all of the features of an electric traction elevator including the capability to be 'drifted' if it fails to operate correctly.

Rail Cars. When a station must be evacuated, an inbound or outbound train can be used to remove passengers from the platform. Fire and rescue personnel must be mindful that if the train has passengers on board, they are likely to exit the train regardless of station conditions when the doors open.

COMMUNICATION SYSTEMS

Several different modes of communications can be used to communicate either from within the Metro system or from external locations outside the Metro system. Each of these methods provides the emergency responders with access to information and control of the activities necessary to mitigate incidents in the Metro system. It is essential to communicate effectively to maintain a safe working environment. Management of an emergency incident in the Metro system requires a constant feedback of information from the fire and rescue units operating at an emergency site, Operations Control Center, and the Metro representatives at the scene.

Operations Control Center (OCC)

OCC maintains radio contact with all personnel responsible for running the railroad. Additionally, telephone communications are available from many areas inside the system in addition to direct telephone communication that is also available between OCC and all local fire and rescue and police departments. The OCC controls all areas known as “revenue areas”. This includes all the rails and stations from one end of the line to the opposite end of the line, and areas where passengers have access to ride the system. All rail yards are in the control of the yardmaster, located in the yard tower.

Any incidents in the yard or on yard trackage, must be coordinated through the yardmaster.

Contacting OCC. When contacting Metro, fire and rescue personnel must provide the following information:

- Who they are - name and department.
- Where they are - by station, chain marker, or building address.
- What the situation is - reason for the call.
- What is requested of Metro.

Telephone Systems

Wayside phones are found in the Emergency Trip Switch (blue light) boxes located along the right-of-way at intervals of approximately 800 feet, as well as at the ends of each station platform and in some service rooms. To use the wayside phone during an emergency, pick up the phone and dial "0" (zero), 1970, or 1652 and you will be connected to OCC. Conference calls can also be made from these phones. A brief list of pertinent phone numbers is located in the ETS box.

PABX System. The Private Automatic Branch Exchange (PABX) System is a separate phone system used to dial numbers within the Metro system only. These phones are found in service rooms, fan shafts, and ancillary rooms and are also part of the Kiosk phone system. In an emergency, OCC can be reached by dialing "1970 or 1962" on a PABX phone.

Outside Public Telephones. These phones can be used to communicate with OCC by dialing 202-962-1970 or 1962. This will allow communications directly with OCC supervisors.

Cellular Phones. Cellular phones can be used to contact Metro OCC in the same manner as other outside public phones by dialing 202-962-1970 or 1962. It is critical that you identify yourself, communicate the reason why you have contacted Metro, and keep to an absolute minimum the background noise and the number of phones used to contact Metro while on the conference lines. The antennae used in the Metro tunnels are on the Verizon Wireless system, enabling the use of compatible cell phones underground. This antennae system can be easily taxed to the point that there are no clear cell signals.

Direct Line Telephone System. OCC has direct telephone lines connected to fire rescue and police communications centers. This system allows for nearly instant communications to and from Metro.

Station Pay Phones. Public pay phones are available in all Metro stations. These phones are located on the mezzanine, near fare card machines and kiosks, on platforms, and near bus shelters.

Radio Systems

The Metro system is equipped with a two-way radio system. Each train, train operator, station manager, and rail supervisor, as well as certain support personnel, have radio communications capability for contact with OCC. The transit police can access this system with their radios. The yards operate on a separate Metro frequency.

Metro personnel can be used as a communications link as their radio is capable of communicating throughout the entire system. Using Metro personnel as the link will require coordination between OCC and the incident commander. The Metro radio system is not compatible with fire and rescue radios.

Fire and Rescue Radio Systems. Metro has equipped each tunnel with an antenna system for the local fire and rescue radio frequency. This system allows jurisdictions with 800MHz radios to communicate underground and to above-ground locations from underground. Jurisdictions must have radio channels for repeaters that are attached to this system to use this antenna.

Public Address Systems

All stations are equipped with a public address system that can be used by OCC or the station manager. In emergencies, information can be given to passengers to direct them to safety. The microphone for the station PA system is in the Kiosk. Fire and rescue personnel can provide directions from this location as well as use this system to provide information to crews working in the station.

Emergency Communications

OCC monitors all Metro radio communications and controls all conference lines. Metro has established a conference line system to aid in the communications at an incident. This line is designed to improve the communications ability by fire and rescue personnel at incidents within the Metro system when their communications systems may not be functioning at peak performance. The line can be accessed from within or outside of the Metro system. The number is 202-962-2218 (outside), or 2218 from any Metro telephone.

This conference line can accept up to ten callers; however, it will start to deteriorate as the number of callers approaches ten. Another drawback is cell phones. Because of the amount of background noise that a cell phone picks up, the maximum number of callers will be reduced by three, for every cell phone that is on the line. Metro will establish the conference line, when the Incident Commander requests. Once done, a caller simply dials into the system and begins conversing. It is recommended that the mode for communicating be the same as over fire and rescue radios.

Command Conference Line. This conference line was designed to allow incident managers to communicate back and forth without the interference of normal incident traffic and the potential of being monitored by outsiders (i.e. the media, scanners). This number rotates through a series of numbers available to Metro and is not assigned until requested. The number is not disclosed until the incident commander contacts OCC by landline. Once the number is given to the Incident Commander, it is up to that person to distribute it to those needing to dial in.

It is recommended that only the following be on the Command Conference Line: the Incident Commander, OCC, (fire dispatch), forward command (division, group), and the Metro On-scene Commander. This conference line has the same degradation problems that other conference lines have.

RIGHT-OF-WAY

The right-of-way can best be described as the areas between the fences and tunnel walls, where the track bed is located. This includes at grade, aerial or elevated, tunnel track ways, emergency stair, exit and vent shafts, and street level hatches and gates.

Access to these areas is restricted and requires coordination with OCC prior to entering. The Metro right-of-way is located in its own corridor as well as in common corridors.

Track Bed

The track bed contains the rails on which the trains operate. The construction varies depending upon whether it is aerial, surface, or subsurface.

Surface. In surface locations, the track bed is constructed of stone and gravel ballast or concrete, Figure 10. The ties are of wood or concrete. Right-of-way (ROW) gates are provided approximately every 800 feet. For convenience, there is an ETS box in close proximity to each gate. The safety walk for the surface right-of-way is normally between the inbound and outbound tracks. The surface is usually of ballast or stone, may or may not be flat and level, and may or may not have trip hazards such as conduit and cabling within it. The third rail normally is between the two tracks.

Figure10 – Surface track bed.

Tunnel (Subsurface). The tunnel track bed is made of poured concrete with metal and neoprene fasteners for tying down the rails. In some instances, a floating slab may be used to reduce the vibrations and noise. This type of track bed is used in areas where noise reduction is required, where crossovers are placed, or where the vibrations may affect the surrounding facilities. The support pads are constructed of rubber, fiberglass, or polyurethane, six inches round and three inches thick.

Tunnels are equipped with fluorescent lights, and spaced forty-feet apart over the safety walk. In the event of a power outage, every fourth light is fed by the backup battery power system. One hundred and ten volt electrical outlets are located under every-other-light in the tunnel. These outlets are not connected to the backup battery power system. The tunnel standpipe and fire department connections are located opposite of the safety walk and above the third rail. The safety walk is 22-inches wide and usually opposite the third rail. In a few locations, the safety walk is located between the third rails but protected by railings. The walkways will be either near the height of the railcar floor, or at the level of the rails and may have track-side equipment or other fixtures that protrude into this space.

Aerial. The aerial track bed is constructed of pre-cast, post-tensioned concrete or concrete/steel sections. These sections have a void space within their core to allow for maintenance of their pier fasteners. The rails are secured with metal and neoprene fasteners.

The aerial structure is equipped with a 22 inch safety walk with railings on both sides to provide safe emergency egress. The safety walk will normally be diamond tread. This covers a raceway containing wiring and other Metro equipment.

Access to elevated structures may be restricted due to surface conditions such as: rivers, buildings, railroad right-of-ways including Metro's, electrical lines, etc. Some bridges will require the use of aerial ladders at high angles for access (between the Huntington and Eisenhower Stations). Others will require the closure of major roadways such as the bridge over the beltway between the Dunn Loring and West Falls Church Stations.

The only bridge with a fire protection system (standpipe) is the Yellow Line Bridge over the Potomac River. All other bridges will require the hand-laying of hose lines.

Tunnels

The below grade portion of the system consist of tracks mounted to the concrete floor of the tunnels. All tunnel floors except the floating slabs are constructed with cast-in-place concrete. The floating slabs are pre-cast. The three types of tunnels are circular, horseshoe, and box (cut and cover) and may be configured in single, double, stacked or any combination of these bores.

Circular tunnels are bored through earth and rock and have either shotcrete or pre-cast panels for the walls. Shotcrete is a cement-like product that is sprayed on rock to form the walls. Pre-cast panels are used in earth bores. These panels are transported to their installation site, and pressed against the earth walls. This method forces the panels to be in compression at all times. Circular tunnels are always single bores. These tunnels will have a safety walk on one side.

Horseshoe tunnels are constructed much like the circular tunnels. These tunnels are bored through rock or earth and have shotcrete, pre-cast concrete or steel ribbed wall linings. Horseshoe tunnels may be in single or doublewide bores. The method of wall/ceiling installation is the same as circular tunnels.

For box (or cut and cover) tunnels, trenches are dug from the surface down and then covered with earth. They are 13 feet 9 inches wide for single-track configuration. These tunnels are also configured in double track widths and have poured concrete walls between the tracks with personnel crossover access every 25 feet of run. The crossovers can only be used if traffic on both tracks is confirmed stopped. The double-wide tunnel is 29 feet wide. The C/J Junction, located in the City of Alexandria, has five non-interconnecting cut and cover tunnels. When responding to incidents in the C/J Junction, it is critically important that the Metrorail Emergency Response Maps be referenced. It would be too easy for units to access the incorrect tunnel and place themselves in the path of moving trains or in close proximity to an energized third rail.

Bridges

Metro uses two types of configurations for its bridges: pre-cast/post tensioned concrete or a concrete/steel combination. Both types are hollow and resemble elongated boxes. The hollow construction members allow for a greater strength-to-weight ratio and provide access for examining the bridge/pier fasteners. This hollow cavity is not a true confined space. However, Metro treats the box girders as a confined area not requiring a permit. Bridge decking is in either single or multiple track configurations, and may be intermixed with surface and tunnel right-of-ways.

Rail

The running rail used in the Metro system is a continuous welded steel rail. This rail also acts as the 'negative return' of the electric traction power system. Because this rail is continuously welded, if broken it can react the same as 'ribbon rail'. The rail may try to return to its designed position. There may be little or no warning before the rail moves. For this reason, no one should stand near or on the rail especially if it has been damaged.

Interlocks. Interlocks are a very hazardous portion of the right-of-way. The interlock is a point where the train can move from one track to another. These components allow trains to move around problems in the system.

OCC may single track around an area that has experienced a blockage, a work zone, or involved in an emergency. The switches use AC power to operate. They are controlled by OCC via computer and have no connection to the third rail. The switches are silent and close in about 2 seconds with no ability to reverse direction if something is in their path. An additional hazard of the interlock is the large number of sections of third rail. These short sections are required to maintain smooth continuous movement of trains.

Should it be necessary to operate within the interlock, several safety precautions must be taken. The switch must be 'blocked'. This can be accomplished by placing a piece of cribbing (4"x4", or 6"x6") vertically between all of the affective switch points. The sections of the third rail must be powered down. If there is an imminent threat to life, the ETS buttons in all of the blue light boxes surrounding the interlock must be depressed. Depending on the location, this could be between 4 and 13 buttons. Anytime an intervention is performed at an interlock, OCC must be notified. At no time shall any personnel operate within the interlocks without the switch points being 'blocked'.

At the conclusion of the incident, all equipment must be removed from the interlock to avoid future incidents.

Electrical Systems

Traction power is used to propel the rail cars. It is also known as third rail power. The third rail is a segmented rail that is located outside of the running rails, with fiberglass cover board and is about four and one half inches higher than the running rails. This rail comes in many different

lengths based on the system needs, with a maximum length of approximately one half mile. Electrical current is received from PEPCO and Dominion Virginia Power at 13,800 and 34,500 volts AC respectively, converted to 750 volts at the Traction Power Substation, and sent to the third rail via underground wiring and "pot head" connections at the rails.

Traction Power Substation. Traction Power Substations (TPSS) can be found above and below ground, within or outside the right-of-ways, within the station proper, or attached to the station. TPSS are located every mile throughout the Metro system. Each rail yard has its own traction power substation. The two local electrical producer/distributors provide power to Metro at the TPSS. Power is converted to DC current and supplied to the third rail. These buildings are considered to be an extreme electrical hazard. They may contain up to 34,500 volts and a potential of 134,000 amps.

Access to these rooms/buildings is restricted. In the event of an emergency, electrical or fire, the fire service must wait for Metro personnel for access. TPSS rooms/buildings, which have a two-hour fire rating, contain heat detectors, ionization detectors, and intrusion alarms for protection and notification. The transformers, which are located in containment pits, are monitored by a system that can shut them down within 30 milliseconds if a problem is detected.

Tie Breaker. Tie Breaker stations (TB or TBS) can be found above and below ground, within or outside the right-of-ways, within the station proper, or attached to the station. TBS contain circuit breakers and are located approximately every mile within the system, mid way between the TPSS. Their function is to allow flexibility in the management of third rail power. If a traction power substation fails, or power is interrupted, the tiebreaker station switches over to another substation to maintain continuous power. These buildings are considered to be an extreme electrical hazard. They may contain up to 34,500 volts and a potential of 134,000 amps. Access to these rooms/buildings is restricted.

In the event of an emergency, electrical or fire, the fire service must wait for Metro personnel for access. These rooms/buildings, which have a two-hour fire rating, contain heat detectors, ionization detectors, and intrusion alarms for protection and notification.

Stray Current. In the Metro system, the principle used for electric distribution to run the rail cars is positive from the third rail and negative return via the running rails. This negative is not a true earth ground. There exists the possibility that electrical current from a rail car or running rail may seek earth ground. High resistance in the usual return of the negative current can cause this. When this happens, the electrical current will find an easier route to get to earth ground. Current can be conducted by a metal object in contact with the rails or rail cars or somebody making contact with one of these items. The voltage involved can be as great as 60 volts. Although this voltage is not lethal, the shock can cause involuntary muscle movement that could cause a person to drop whatever they are working with.

Abnormal Conditions. There are two conditions that may exist which conceivably could cause this voltage leak:

- When a traction power substation is down for regular maintenance. In this situation, current has to travel a much further distance to return to the substation ground. This increases the resistance, which the negative electricity has to overcome, and current will seek the path of least resistance, an easier route to ground.
- When yard power is supplied by a mainline traction power substation. Again, the electrical current travel distance may be great and the same problem could occur as described in "A".

Emergency Trip Station/Blue Light Boxes. Boxes or cabinets are located approximately every 800 feet along the right-of-way and at the ends of station platforms. These boxes contain a wayside telephone for communicating with Operations Control Center (OCC), an Emergency Trip Switch (red button) to deactivate third rail power, and a power removal map. They are identified by a blue light on top of the box or cabinet. The blue light is only a locating marker and has no bearing on the status of third rail power.

When contacting Metro by Blue Light Box for power removal or other needs, fire and rescue personnel must provide the following information:

- Who they are - name and department.
- Where they are - by station, chain marker, or building address.
- What the situation is - reason for the call.
- What is requested of Metro.

The red mushroom button inside the ETS is used to trip breakers in the TPSS to remove power from the third rail. **This button should only be pushed when there is an imminent threat to life safety.** If the ETS button is activated, it must be followed up with a call to OCC. Without a follow up call, OCC will attempt to reset the tripped breakers. It is necessary to ensure that the phone cord is not in a position to depress the ETS button when the Blue Light Box is closed. Most ETS are guarded to prevent this occurrence.

Each Blue Light Box is equipped with a power removal map. This map identifies all sections of third rail (from chain marker to chain marker) affected by this ETS and the sections of third rail in the immediate area that are not controlled by it. It also identifies the phone number for this ETS box and adjacent boxes, the chain marker, the track number, and the closest stations.

Fire Protection

Fire protection along the right-of-way is provided in the stations, tunnels, and on the Yellow Line Bridge over the Potomac River. Standpipes are provided on the Yellow Line Bridge, in all revenue tunnels, and at all stations (excluding the Rhode Island Avenue Station in Washington, DC.) The connections for the standpipes are every 200 feet. Fire extinguishers are located at the ETS boxes in the tunnels. All buildings within the right-of-way will have, at minimum, portable fire extinguishers.

Service and Inspection Yards

Rail car maintenance and repair facilities are located along most of the system's lines. In Fairfax County, the yard is located off the Orange Line north of the West Falls Church Station. In Alexandria, the Eisenhower Yard is on the Blue line. These facilities are outside the control of OCC. They fall under the control of the Yard Master who is located in the Yard Tower.

Yard limits normally will be marked by separate chain markers with either the identifier "YT" for yard track or "LT" for lead track. Wherever these markers appear, the control of third rail power and train movement is the responsibility of the yardmaster. OCC cannot remove third rail power to the yard; this must be done from the yard tower.

There are several buildings located within the yard. Of primary importance to the fire service are the Traction Power Substations, Tie Breaker Stations, and Service and Inspection Shops. Each yard has its own Traction Power Substation and Tie Breaker Station to insure uninterrupted power for train movement and facility operations. All shop buildings contain the standard fire detection and suppression equipment including sprinklers.

Service and Inspection Shop. Service and Inspection Shops are usually the largest building in the yard complex. They contain the rail car maintenance and repair facilities. These buildings contain a shop "stinger" 750-volt system that allows power to be supplied to the rail cars so that they can move in and out of the building. The "stinger" is a spring clip that attaches to one of the third rail collector shoes on the rail car. The 750-volt "DC" line that supplies the stinger is located in overhead cable troughs. "Stinger" power is controlled by a switch mounted on the cable from the overhead 750-volt power track. Due to the overhead electrical hazard, fire and rescue personnel should refrain from using metal ladders in this building. The emergency shutoff (red mushroom button) for the 750-volt stinger power is located on the shop wall and may be unmarked.

Identification

Because of the complexity of the Metrorail system, a series of identification markers has been developed to assist in locating your position along the right-of-way. When dealing with an emergency in the system, it is a great advantage to be able to pinpoint your exact location. This allows for faster deployment of resources and reduces the impact of the emergency on the remainder of the Metrorail system by confining operations in the immediate area and rerouting service around the incident location.

Chain Markers. Chain markers are a system of measurement along the right-of-way, Figure 11. A marker is located every 100 feet along the entire right-of-way, surface, aerial, and subsurface.

Figure 11 – Chain marker.

Measurements start from a center point or hub station. There are two hub stations in the system: Gallery Place and

Metro Center. The markers are located between the tracks or affixed to the fence along the at-grade or elevated right-of-way, or mounted on the walls of the tunnels throughout the Metro system.

Chain markers may also be found on ancillary room doors or buildings as a means of fixing their location within the system. A typical chain marker reads “K1_880+00”. This would be read as “K” line, track 1, 88,000 feet from the HUB.

Signage. The Metro system uses ample signage to identify routes of travel, distances between points, closest points and exits, directions for opening hatches and doorways, dangerous locations and zones, access points, and warning to non-authorized persons.

Emergency Access/Egress

Access and egress methods differ based on the type of right-of-way: surface, aerial, or tunnel (subsurface).

Surface. Right-of-way emergency access gates, Figure 12, are located approximately every 800 feet along the surface right-of-way and at the ends of the platforms at surface stations. A sign containing the gate letter ID, the line and track number, and the closest chain marker (CC K1 525) identifies the gates. To locate the lower numbers and letters, proceed toward the HUB Stations.

Figure 12 – Right-of-way emergency access gates.

A padlock, the key to which is on the Metro key ring, secures these gates. For convenience, there is an ETS box in close proximity to each gate. The safety walk for the surface right-of-way is normally between the inbound and outbound tracks. The surface is usually of ballast or stone, may or may not be flat and level, and may or may not have trip hazards such as conduit and cabling within it.

Discharging passengers into the right-of-way should be a last resort action. It is far better to move passengers to an unaffected car of the train. If the passengers cannot remain on the train, they must be discharged through the bulkhead doors, not the side doors. This will eliminate the possibility of contacting the train and the grounded fence simultaneously. If a passenger were to contact the train and the fence, they could become grounded. Passengers shall be escorted to the

closest station, right-of-way gate to waiting transportation, or to rescue trains. Third rail power must be de-energized along the entire evacuation route.

Aerial. Passenger evacuation onto an aerial right-of-way should only be attempted as a last resort. Whenever possible, protect the passengers in the train in unaffected cars or on a rescue train. If this is not possible, move the passengers to the safety walk, between the tracks. The preferred method of evacuating the train on an aerial structure is by way of door **# 9** if it is not over the third rail or adjacent to the outer side of the bridge.

It must face the opposite rail. If door #9 is not accessible, then the end bulkhead door must be used. To access the safety walk, passengers may have to cross over the third rail. **The third rail must be de-energized along the entire evacuation route!**

Tunnel. Emergency exits are provided throughout the tunnel system. At single entry underground stations, there will be an emergency exit shaft located opposite the main entrance. In the tunnels proper, the emergency exit shafts may be located in vent shafts, fan shafts, or in single use emergency exit shafts between stations. With the exception of three locations, the maximum travel distance to an emergency exit is 1250 feet. The exceptions to the distance rule are a section of the Blue Line between the Stadium Armory and Benning Road Stations, which is 1500 feet, the Orange/Blue Line between Foggy Bottom and Rosslyn, (under the Potomac River) which is 1558 feet, and the Yellow Line between L'Enfant Plaza Station and the Potomac River Portal which is 1550 feet.

Emergency exit shafts will be equipped with metal open grate stairways that may rise up to 220 feet to the surface. At street level, the shaft will be equipped with either solid or open grate doors that must be pushed up to open. The undersides of these doors have panic hardware to allow opening from the inside. These doors have an exterior keyway that can be unlocked by using the Metro tool. Some will have a bung cap with a padlock to prevent unauthorized access. The key for this lock is on the Metro key ring.

Because of the possibility of passenger panic, limited lighting, and narrow walkways, evacuation of people from a train into the tunnel is only recommended as a last resort. Every effort should be made to protect the passengers in the train. This can be accomplished by moving the passengers to unaffected cars of the consist or by using a rescue train to move the passengers to a safe area. If the passengers must be evacuated from the train, use door #9 on the safety walk side. Except when moving passengers to a rescue train, the third rail power along the entire evacuation route must be deenergized.

The tunnel at the Huntington Station complies with the tunnel fire protection standards except that it is connected to the station standpipe system and it is a dry pipe system.

Common Corridor

The Metro right-of-ways are located in many accessible and non-accessible areas. Some of the right-of-ways are placed in locations not easily visible from neighboring streets, and with little or

no access. Other portions are adjacent to roadways. Aerial and tunnel portions travel above or below roadways, waterways, parklands, and buildings.

All of the Metro lines have some trackage within common corridors, Figure 13. In Fairfax and Arlington Counties, the K line runs in the median of Interstate Route 66 and the J line runs adjacent to the CSXT railroad from Alexandria to Springfield. In other portions of the system, the right-of-way is adjacent to the Norfolk Southern Railroad.

Figure 13 – All Metro lines have some tracks within common corridors.

Intrusion Detection and Warning System. The Intrusion Detection and Warning System (IDW) is designed to warn OCC that something has penetrated the right-of-way fencing or barrier wall and is a danger to Metro trains and passengers. The system consists of a frangible cable attached to the right-of-way fencing or barrier wall and connected to tilt switch boxes.

The IDW is on the surface right-of-way in common corridor areas only. Should an automobile or rail vehicle break through the fence or cause it to tilt more than 30 degrees, the IDW sounds an alarm at OCC and the computer removes the ATC systems for the affected area, causing all rail traffic to stop immediately. **The IDW does not power down the third rail.**

METRORAIL RESPONSES

The Metrorail system throughout Northern Virginia presents the emergency responder with many challenges and will be very different from routine operations. A Metrorail emergency could rapidly overwhelm any Department's resources, as the number of potential victims is staggering.

The mitigation of emergency incidents involving Metrorail requires a deliberate, coordinated approach by all responders. Failure to successfully implement a coordinated effort in response to a Metrorail incident has great potential for injury, if not death to emergency personnel and citizens.

Incidents within the Metrorail system require officers to constantly perform risk/benefit assessments. The safety of emergency personnel, Metro employees, and the citizens exposed to the incident is paramount.

While considerable judgment must be extended to on-scene personnel when responding to emergency incidents within the Metrorail system, it is imperative that first arriving units follow basic safety and operational procedures.

Safety

All personnel entering any Metro track bed shall wear full personal protective equipment (PPE) including self-contained breathing apparatus if an IDLH exists. Personnel are not required to wear full PPE if responding to a medical call on a platform, train, or in a station. All personnel shall carry a hand light and don reflective gear prior to operating anywhere in the Metro system.

Personnel shall always use the "buddy system" when operating in a tunnel area. Under no condition shall anyone operate or enter a tunnel alone.

If the dispatch is for a WMD or hazardous materials incident, no unit is to position itself in the path of the airflow from any emergency exit or vent shaft.

Track Bed Safety. Personnel shall not enter the track bed or tunnel until all of the following provisions have been met:

- Permission has been granted by the Incident Commander.
- Metro OCC has confirmed that all power has been removed.
- Metro OCC has confirmed that all train movement in the area has been stopped.
- The third rail has been tested by fire department personnel using the volt probe or hot stick.

Personnel operating in the right-of-way should always be watching for unexpected train movement. Flagging procedures should be used to warn oncoming trains of an obstruction on the rail track. Personnel equipped with flashlights and portable radios should be stationed as flaggers approximately 750 feet on each side of the incident.

Be aware that an approaching train may not be heard and air movement may not be felt. A moving train is the greatest hazard on the railroad.

Personnel shall not enter any shaft from the street except when it is also an emergency exit with a stairway and the incident commander has ordered such entry. Fan and vent shafts that have only fixed ladders are too steep and narrow to provide adequate safety and do not always terminate at the track bed area.

"NO CLEARANCE" signs are displayed at locations where there is insufficient clearance between the train and the tunnel walls. Use extreme caution when operating in these areas, as there is no safe refuge area.

Third Rail Power Safety. Personnel shall always treat the third rail as if it were energized. Never touch, place equipment, or step on the third rail even after it has been confirmed down.

As Warning Strobe and Alarm Devices (WSADs) become available, they shall be placed on each section of de-energized third rail.

The best method for power removal is to have OCC remove power between specific chain markers.

Third rail power may be removed at ETS buttons located every 800 feet along the right of way. Activation of the ETS shall be done only in extreme life safety emergencies. To remove power via the ETS depress button, dial "0" from the ETS station phone, provide OCC with name, title and unit number, track number and location, and the reason for ETS activation. Wait for confirmation that power has been removed, trains in the area have been stopped, and OCC has authorized entry onto the track bed.

Incident Operations

Incidents within the Metrorail system can range from BLS responses to mass casualty incidents. Victim counts may easily be in the thousands.

In order to provide the coordinated effort required to mitigate emergency incidents within the Metrorail system, it is necessary to categorize the myriad of potential incident types into the following response categories:

- EMS incidents in trains or stations.
- EMS in the right-of-way/track bed.
- Fire, collision, or derailment at surface or above grade.
- Fire, collision, or derailment below grade.

EMS Incidents in Trains or Stations. The most common type of incident occurring within the Metrorail system is the EMS incident on a train or at a station. Metro personnel make every effort to transport sick or injured personnel to the nearest station.

Although each jurisdiction may add to the response compliment, the minimum resources assigned to EMS incidents in a station or on a train are:

- 1 ALS or BLS Unit; and
- 1 First Responder Unit (engine, truck, rescue).

It is anticipated that most EMS incidents of this nature will be mitigated without difficulty. However, there are several factors that personnel must be aware of. The nature of the illness or injury and the location of the patient may differ significantly from dispatch information. Therefore, it is imperative that personnel make contact with the senior Metro official immediately upon arrival. The exact location and nature of the incident must be confirmed as soon as possible. EMS personnel may have to wait for the train to arrive at the platform with the patient.

EMS personnel must recognize the potential for these types of incidents to actually be located within the right of way/track bed, or other perilous location.

Should responding units determine that the incident or patient is located on the right-of-way/track bed, additional resources must be requested immediately. ALL personnel shall don reflective material (traffic vest, turnout coat).

EMS Incidents in the Right-of-Way/Track Bed. These types of incidents can present a myriad of issues for emergency personnel. Regardless of the nature of the incident, emergency personnel must follow all established safety rules prior to entry into the right of way or track bed.

Although each jurisdiction may add to the response compliment, the minimum resources assigned to an EMS incident within the right of way/track bed are:

- 1 ALS or BLS Unit
- 1 Engine Company
- 1 First Responder Unit (engine/truck)
- 1 Rescue Company
- 1 Battalion Chief
- 1 EMS Supervisor

As with any incident occurring within the Metrorail system, it is imperative that the exact location and nature of the emergency be determined as soon as possible.

The first arriving unit shall make contact with the senior Metro official and attempt to confirm the location and nature of the incident. In addition, the first arriving unit shall attempt to determine the status of third rail power, train movement, and other pertinent information. With the exception of the EMS unit and the first arriving suppression unit, unless otherwise directed, all units shall respond to the dispatched location and stand-by for confirmation of the exact location and nature of the incident.

Should the location of the incident be in the right of way or track bed, the first arriving suppression officer on the scene shall establish command.

Failure to successfully implement a coordinated effort in response to these types of incidents can result in injury or death to emergency personnel.

EMS personnel shall don reflective material (traffic vest, turnout coat) and all suppression personnel shall be in full turn out gear. The level of protective equipment worn may be modified by the incident commander; however, at minimum, each person shall don clothing that contains reflective material such as a traffic vest or a turn out coat.

All safety precautions shall be initiated prior to personnel entering the right-of-way or track bed.

Fire, Collision, or Derailment At-Surface or Above-Grade. Although emergency incidents of this nature should be easier to mitigate and manage than those occurring below grade, there are numerous problems that are unique to these type incidents.

Access to the incident scene may be remote from streets or the incident location may be in close proximity to busy streets, interstate highways, other railroad right of ways, or neighborhoods. In addition, units may be dispatched to the nearest station or other points of access such as ROW gates, overpasses, or street intersections.

The type and severity of these incidents has the potential to range from a report of smoke on a train, to a crash/derailment with an excess of 1,000 victims.

While considerable judgment must be extended to on-scene personnel when responding to emergency incidents with such potential, it is imperative that the first arriving companies follow established safety and operational procedures.

Although each jurisdiction may add to the response compliment, the minimum resources assigned to a structure or railcar fire, collision, derailment, at surface/above grade are:

- 4 Engine Companies
- 2 Truck Companies
- 2 EMS Units (1 must be ALS)
- 1 Rescue Company
- 2 Battalion Chiefs
- Technical Rescue Unit (for collision or derailment)
- 1 EMS Supervisor

The minimum resources assigned to an outside fire on the Metro right-of-way (rail ties, brush, etc.) are:

- 2 Engine Companies
- 1 Rescue Company
- 1 Battalion Chief

Engine Company Responsibilities

Engine company personnel should be prepared to complete a wide variety of tasks associated with incidents of this nature. These tasks range from water supply and/fire attack, to triage, treatment and transportation of patients.

Although it is not possible to include all of the tasks or responsibilities that an engine company may be assigned, numerous tasks must be completed and assigned accordingly.

First Due Engine Company. The primary responsibility of the first due engine, along with the first due truck, is to conduct reconnaissance, gathering as much pertinent information as possible. Pertinent information includes: the exact location and nature of the incident, status of third rail power, and the status of trains in or approaching the incident location.

The first due engine shall position adjacent to the main entrance of the reported station. On incidents other than stations, the first due engine shall take the most advantageous position for conducting recon. It is imperative that the first due engine communicate its location to the first due truck in order to establish a recon group.

For incidents occurring in the proximity of a station, the first due engine shall meet with the senior Metrorail official on the scene and obtain the following information:

- Exact location and nature of the incident;
- Status of the third rail power;
- Status of train movement in the area;
- The estimated ETA of the Metro on-scene commander; and
- The location of any and all required keys.

The first due engine shall transmit a situation report upon receipt of the above information.

The first due engine company, along with the first due truck company, shall form the recon group in the area of the KIOSK or entry point. The recon group supervisor shall gather all pertinent information regarding the incident and/or station from the KIOSK. Unless otherwise established, the KIOSK shall serve as the passport drop-off point.

Once permission has been granted by the IC, the recon group shall proceed to the reported incident location and report their findings to include; nature and severity of incident, assistance required, exact location via chain marker, standpipe identification, status of third rail, and the location of an alternative access point if beneficial.

The first due engine company shall take such actions as required to mitigate the incident. These actions may include, but are not limited to fire attack, evacuation, triage and treatment

Second Due Engine Company. The primary responsibility of the second due engine is to respond to the dispatched location and coordinate water supply operations. Water supply operations may be as simple as connecting to the identified standpipe or being in charge of relay operations in the proximity of interstate highways or other corridors.

If complex water supply operations are required, it is anticipated that the officer on the second engine will become the water supply group supervisor. It is imperative that the second due engine not commit to a specific water supply until the recon supervisor relays accurate information.

The officer on the second due engine should give consideration to assigning the remainder of his/her crew to another company.

Third Due Engine Company. The third due engine shall proceed to the mezzanine /kiosk area. If a chief has not yet arrived, the officer on the third due engine shall assume command of the incident.

The remainder of the crew shall commence kiosk control operation. The kiosk control group responsibilities include: interim accountability, unit tracking, entry control, passenger evacuation, conference line maintenance, fire alarm system monitoring, station communications systems, and closed circuit television monitoring.

Once relieved of command, the officer shall become the kiosk control group supervisor.

Fourth Due Engine Company. The fourth due engine shall report to command and assume RIT duties.

Truck/Rescue Company Responsibilities

Metrorail incidents do not lend themselves to traditional truck company operations. It is anticipated that there will be little to no traditional truck work required. It is anticipated that truck companies will be used as recon, safety, RIT, evacuation, and in other nontraditional truck company tasks.

The majority of rescue companies in the Northern Virginia area carry the Metrorail assigned WSADs. Although rescue companies carry many of the heavy lifting and prying tools that may be required, it is not anticipated that the first due Rescue Company will perform tasks at this level.

First Due Truck Company. The primary responsibility of the first due truck company is to operate within the recon group and perform the safety function. The first due truck shall meet up with the first due engine in the mezzanine/kiosk area and form the recon group.

The first due truck shall monitor the recon operations for safe practices to include: monitoring third rail power, monitoring train movement, and monitoring passenger movement in the area of the incident and along the evacuation route.

Second Due Truck Company. The second due truck company shall report to the incident commander for assignment.

First Due Rescue Company. The primary responsibility of the first due Rescue Company is to procure and place the first two WSAD's. After WSAD placement, the rescue company shall report to the Recon Group supervisor for assignment.

Technical Rescue Unit. The technical rescue unit shall report to the incident commander for assignment.

Tools/Equipment

The following is a list of the minimum required tools/equipment to be taken to the incident location. All units that are dispatched that carry WSADs shall bring them to the scene.

Engine Companies:

- Portable radios as assigned
- Standpipe pack
- Metro chocks
- Metro keys
- Halligan bar/Flat head axe

- Tag line
- Volt probe/Hot stick
- Hand lights (all personnel)
- EMS bag (non fire incidents)

Truck/Rescue Companies:
- Portable radios as assigned
- Metro chocks
- Metro tool
- Metro keys
- Hydra ram
- Halligan bar/Flat head axe
- Hand lights (all personnel)
- Lights with cord reel
- Volt probe/hot stick
- Tag line
- EMS bag (non fire incidents)

EMS Units:
- Portable radios as assigned
- Hand lights
- EMS bags (trauma, airway, etc.)
- Stretcher
- Portable oxygen
- Defibrillator/monitor
- Backboard, collars, straps

Command Operations

The mitigation of emergency incidents involving Metrorail requires a deliberate, coordinated approach by all responders. The complex nature of these type incidents requires focused attention on tactical control, operational tasks, accountability, safety, and communications.

First Due Battalion Chief Responsibilities. The primary responsibilities of the first due battalion chief include the following:
1. Establish contact with the interim IC and obtain pertinent information.
2. Establish a command post.
3. Provide an updated situation report.
4. Establish and maintain communications with operating units, confirm assignments.
5. Establish and maintain communication with Metro OCC through the following: command conference outside line at 202-962-1652 or 1970 and the Metro on-scene commander.
6. Appoint a Planning Officer and secure a command channel.
7. Ensure SITSTAT/RESTAT/ACCOUNTABILTY functions are performed.
8. Establish and appoint branch, division, and group assignments.
9. Evaluate, develop, and monitor incident action plans.

10. Request and assign additional resources as needed to mitigate emergency.

Second Due Battalion Chief. The primary responsibility of the second due battalion chief shall be those duties most closely associated with operational tasks. It is anticipated that the IC will request that the second battalion chief assume the Operations Chief Section or a position as a Branch Director.

EMS Supervisor Responsibilities. The primary responsibility of the EMS Supervisor shall be the EMS Branch Director. The EMS Supervisor shall be responsible for developing the emergency medical plan and directing all aspects of EMS operations.

Fire, Collision, Derailment Below Grade

Mitigating emergency incidents of this nature will be considerably different than those at or above grade. There are numerous problems that are unique to these type incidents.

Access to the incident scene may be portals that are remote from street access or vent/emergency exit shafts in close proximity to busy streets, interstate highways, other railroad right of ways, or neighborhoods.

The type and severity of these incidents has the potential to range from a report of smoke on a train, to a crash/derailment with in excess of 1,000 victims.

While considerable judgment must be extended to on-scene personnel when responding to emergency incidents with such potential, it is imperative that the first arriving companies follow established safety and operational procedures.

Personnel shall always use the "buddy system" when operating in a tunnel area. **Under no condition shall anyone operate or enter a tunnel alone.**

Although each jurisdiction may add to the response compliment, the minimum resources assigned to a fire, collision, derailment, below grade are:

- 4 Engine Companies
- 2 Truck Companies
- 2 EMS Units (1 must be ALS)
- 1 Rescue Company
- 2 Battalion Chiefs
- 1 Technical Rescue Unit (for collision or derailment)
- 1 EMS Supervisor

Engine Company Responsibilities

Engine company personnel should be prepared to complete a wide variety of tasks associated with incidents of this nature. These tasks range from water supply and/fire attack, to triage, treatment and transportation of patients.

Although it is not possible to include all of the tasks or responsibilities that an engine company may be assigned, numerous tasks must be completed and assigned accordingly.

First Due Engine Company. The primary responsibility of the first due engine, along with the first due truck, is to conduct reconnaissance and gather as much pertinent information as possible. Pertinent information includes; the exact location and nature of the incident, status of third rail power, and the status of trains in or approaching the incident location.

The first due engine shall position adjacent to the main entrance of the reported station. On incidents other than stations, the first due engine shall take the most advantageous position for conducting recon. It is imperative that the first due engine communicate its location to the first due truck in order to establish a recon group.

For incidents occurring in the proximity of a station, the first due engine shall meet with the senior Metrorail official on the scene and obtain the following information:

- Exact location and nature of the incident.
- Status of the third rail power.
- Status of train movement in the area.
- The estimated ETA of the Metro on-scene commander.
- The location of any and all required keys.

The first due engine shall transmit a situation report upon receipt of the above information.

The first due engine company, along with the first due truck company, shall form the recon group in the area of the KIOSK. The Recon group supervisor shall gather all pertinent information regarding the incident/station from the KIOSK. Unless otherwise established, the KIOSK shall serve as the passport drop off point.

Once permission has been granted by the IC, the recon group shall proceed to the reported incident location and report their findings to include: nature and severity of incident, assistance required, exact location via chain marker, standpipe identification, status of third rail, and the location of an alternative access point if beneficial.

The first due Engine Company shall take such actions as required to mitigate the incident. These actions may include, but are not limited to fire attack, evacuation, triage, and treatment.

Second Due Engine Company. The primary responsibility of the second due engine is to respond to the dispatched location and coordinate water supply operations. Water supply operations may be as simple as connecting to the identified standpipe or being in charge of relay operations in the proximity of interstate highways or other corridors.

If complex water supply operations are required, it is anticipated that the officer on the second engine will become the water supply group supervisor.

It is imperative that the second due engine not commit to a specific water supply until the recon supervisor relays accurate information.

The officer on the second engine should give consideration to assigning the remainder of his/her crew to another company.

Third Due Engine. The third due engine shall proceed to the mezzanine /kiosk area. If a chief has not yet arrived, the officer on the third engine shall assume command of the incident. The remainder of the crew shall commence kiosk control operation. The kiosk control group responsibilities include: interim accountability, unit tracking, entry control, passenger evacuation, conference line maintenance, fire alarm system monitoring, station communications systems, and closed circuit television monitoring.

Once relieved of command, the officer shall become the kiosk control group supervisor.

Fourth Due Engine Company. Fourth due engine shall report to command and assume RIT duties.

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Second Due Truck Company. The second due truck company shall report to command for assignment.

First Due Rescue Company. The primary responsibility of the first due rescue company is to procure and place the first two WSAD's. After WSAD placement, the rescue company shall report to the Recon Group supervisor for assignment.

Technical Rescue Unit. The technical rescue unit shall report to the incident commander for assignment.

Tools/Equipment

The following is a list of the minimum required tools/equipment to be taken to the incident location. All units dispatched carrying WSADs will bring them to the scene.

Engine Companies
- Portable radios as assigned
- Standpipe pack
- Metro chocks
- Metro keys
- Halligan bar/Flat head axe
- Tag line
- Volt probe/Hot stick
- Hand lights (all personnel)
- EMS bag (non fire incidents)

Truck/Rescue Companies
- Portable radios as assigned
- Metro chocks
- Metro tool
- Metro keys
- Hydra ram
- Halligan bar/ Flat head axe
- Hand lights (all personnel)
- Lights with cord reels
- Tag line
- EMS bag (non fire incidents)

EMS Units
- Portable radios as assigned
- Hand lights
- EMS bags (trauma, airway, etc.)
- Stretcher
- Portable oxygen
- Defibrillator/monitor
- Backboard, collars, straps

Command Operations

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6. Appoint a Planning Officer and secure a command channel.
7. Ensure SITSTAT/RESTAT/ACCOUNTABILTY functions are performed.
8. Establish and appoint branch, division, and group assignments.
9. Evaluate, develop, and monitor incident actions plans.
10. Request and assign additional resources as needed to mitigate emergency.

Second Due Battalion Chief. The primary responsibility of the second battalion chief shall be those duties most closely associated with operational tasks. It is anticipated that the IC will request that the second battalion chief assume the Operations Chief Section or a position as a Branch Director.

EMS Supervisor Responsibilities. The primary responsibility of the EMS Supervisor shall be the EMS Branch Director. The EMS Supervisor shall be responsible for developing the emergency medical plan and directing all aspects of EMS operations.

METRO OPERATIONS CENTRAL CONTROL

The Operations Central Control is the central focal point of the Metrorail system. The controllers at this location are responsible for the day-to-day normal operation of the revenue rail system including: all train movement on the revenue right-of-way, management of third rail power, passenger information, alarm monitoring, emergency reporting, and linking communications. Although OCC is the heart of train operations, the Metro system is designed to operate without OCC being online. Trains can be operated by “line of sight.” This would only occur if there was a catastrophic systems failure at OCC.

When contacting Metro OCC, fire and rescue personnel must provide the following information:

- Who they are - name and department.
- Where they are - by station, chain marker, or building address.
- What the situation is - reason for the call.
- What is requested of Metro.

INCIDENT MANAGEMENT

Many resources must be effectively and efficiently managed during an emergency in the Metro system. A major incident may involve many agencies from local and federal governments. The Incident Management System has been designed to answer this challenge.

Keep in mind that the Incident Management System is intended to be flexible and modular. This means that the Incident Commanders can use the components that are needed, and should expand or reduce the organization depending on the changing conditions of the incident. Incident managers must be prepared to request additional resources in excess of normal incident upgrades, such as multiple additional alarms, and should anticipate units responding from extended distances including outside the immediate region.

The overall strategy for managing a Metro emergency can be organized into four steps. These four steps can be remembered by using the acronym A.C.R.E.

- **A**ccess – Locate the emergency and find the best access to the site.
- **C**ontrol – Control the emergency; manage the victims, remove the hazards, extinguish any fires, ventilate, and organize the scene.
- **R**escue – Rescue any entrapped victims.
- **E**vacuate and **E**MS – Evacuate the site and provide emergency medical care as needed.

On-Scene Commander

The Metro on-scene commander will be the senior ranking Transit Police Officer on the scene. This officer is tasked with coordinating all Metro activities at the incident scene, and providing direct operational assistance to the fire and rescue Incident Commander.

The coordination of these activities will be subject to the approval of the Incident Commander. In the absence of a transit police officer, the senior transit rail supervisor or station manager will be the on-scene commander.

Emergency Communications

OCC monitors all Metro radio communications and controls all conference lines.

Conference Line. Metro has established a conference line system to aid in the communications at an incident. This line is designed to improve the communications ability by fire and rescue personnel at incidents within the Metro system when their communications systems may not be functioning at peak performance. The line can be accessed from within or outside of the Metro system. The number is 202-962-2218 (outside), or 2218 from any Metro telephone.

This conference line can accept up to ten callers; however, it will start to deteriorate as the number of callers approaches ten. Another drawback is cell phones. Because of the amount of background noise that a cell phone picks up, the maximum number of callers will be reduced by

three for every cell phone that is on the line. Metro will establish the conference line, when the incident commander requests. Once this is done, a caller simply dials into the system and begins conversing. It is recommended that the mode for communicating be the same as over fire and rescue radios.

Command Conference Line. This conference line was designed to allow incident managers to communicate back and forth without the interference of normal incident traffic and the potential of being monitored by outsiders (i.e. the media, scanners). This number rotates through a series of numbers available to Metro and is not assigned until requested. The number is not disclosed until the incident commander contacts OCC by landline. Once the number is given to the Incident Commander, it is up to that person to distribute it to those needing to dial in. It is recommended that only the following be on the Command Conference Line: the Incident Commander, OCC, fire dispatch, forward command (division, group), and Metro On-scene Commander. This conference line has the same degradation problems that the other conference lines have.

EMERGENCY PROCEDURES

The shear complexity of the Metro system leads to a potential significant number of types of incidents. Because the number is so high, only the most probable types will be covered here. The basics will be the same for most common types of incidents. The number one concern will be for the safety of the fire and rescue personnel.

Although the third rail is referenced to great extent, the primary concern in the right-of-way is moving trains.

Units dispatched to incidents within the Metro system should respond to the entrance or access point recommended by OCC or set by preplan. If the incident is located on an aerial structure, in a tunnel, or not clear, a bi-directional response shall be considered.

EMS Tactics and Considerations

Units assigned to medical emergency in Metro shall be dispatched to the closest station or point of access recommended by OCC. They may need to wait on the arrival of a train for their patient. If upon arrival at the scene, a unit discovers that the incident is actually in the right-of-way, they shall immediately notify fire communications and OCC and request additional resources to safely operate in that environment.

Mass Casualty Incidents. A Metrorail emergency can be very different from routine operations. The potential number of victims is staggering. One Metro train can carry as many as 1600 passengers. Therefore, the potential for a mass casualty incident resulting from a fire, derailment, accident, or hazardous material release is great. Incident managers must be prepared to request additional resources in excess of normal incident upgrades, such as multiple additional alarms, and should anticipate units responding from extended distances including outside the immediate region.

Engine Company Tactics

Water Supply. Although pre-connected lines are an option for stations and other surface areas, almost all attack lines in Metro facilities will be operating from standpipes.

Figure 14

Supplying the correct standpipes, and doing it efficiently will be critical. Factors concerning water supply are location of standpipe Siamese connections, proximity of fire hydrants, and personnel requirements. Every station standpipe connection has an ID plate that identifies the shaft number, the maximum vertical drop, and the maximum horizontal run of the piping. This information will permit the pump operator to correctly supply the system.

All stations in Northern Virginia except Franconia-Springfield have standpipe systems that allow for connecting and supplying on the outside of the station and the option of connecting to the system inside the station within a short distance of the entrance.

Every station and underground portion of the revenue right-of-way, excluding the Rhode Island Avenue Station in DC, is equipped with a standpipe system. This system services the station as well as the platform. All subsurface station standpipes except Huntington are wet systems; surface, tunnel and aerial systems are dry pipe systems. The station, tunnel, and south parking structure systems at Huntington are dry-pipe and interconnected.

The hose valves are located at 200-foot intervals in the tunnels and under the station platforms. There are additional hose valves in the fire equipment cabinets and various locations within the system. At all station and tunnel incidents with reported smoke or fire, the engine company should connect to and prepare to charge the system upon orders.

At no time should water be discharged in the direction of the third rail. Anytime the system is charged OCC shall be notified of such so that they may dispatch the appropriate personnel to drain and check the system for deficiencies.

Stations. Most, if not all fires in Metro stations can and should be handled by the use of fire extinguishers. In those rare instances when this is not possible, there shall be no hesitation in using hose streams of the proper size and volume. All personnel shall bear in mind that there is a large amount of electricity in the stations. Efforts shall be made to disconnect and discharge all electricity in the area of the fire before fire attack commences.

Smoke/Fire on Train. In the event that there is a fire on a train, use of portable fire extinguishers should be attempted first. The third rail shall be deenergized as soon as possible.

Truck Company Tactics

There will be very little traditional truck work. Truck companies will most likely be concerned with safety supervision, emergency medical care, logistical and support functions. Ventilation will be accomplished by built-in systems.

Part of the safety duties will most likely include flagging. Flagging procedures are used to warn oncoming trains and railroad equipment of an obstruction on the tracks. Personnel should be positioned in a safe area between the inbound and outbound tracks or on the outer area of the track bed, not in a '**NO CLEARANCE**' zone or between the rails. Personnel shall be equipped with flashlights, highway flares, portable radios, and reflective clothing (safety vest, turnout coat).

The flaggers should be positioned in a safe area approximately 750 feet away from both ends of the incident for Metro trains; for other railroads they need to be positioned two miles from the incident.

Metro will dispatch a variety of its resources to the incident, some of which will travel by rail. If a train or railroad vehicle approaches, stand in a safe area facing the train, swing the lighted hand light or flare **horizontally from side-to-side** in front of their body so that it can be seen be the train or vehicle operator.

This is a standard railroad signal instructing the operator to stop immediately. The lagger shall notify command or the incident safety officer of the status of any and all approaching equipment on the tracks.

Rescue Company Tactics

There are two basic types of rescue incidents that may occur at Metro, entrapment in machinery or entrapment involving trains. Both will require more patience and personnel than normal.

Rescues from Machinery. Rescues from machinery at Metro facilities include persons trapped by or stuck in elevators, inclinator, escalator, or train repair equipment. The specific entrapment may dictate the need for a Technical Rescue Response.

Elevators/Inclinator. The primary entrapment in the Metro system is people stuck in elevators. When OCC is notified of a problem with an elevator, they dispatch an elevator mechanic. This mechanic will usually arrive prior to or during fire and rescue operations.

The elevators normally stop because they are overloaded and do not reach the floor sensor for the doors. The standard cure for a stuck elevator is to 'drift' it to the next platform, release the doors and allow the occupants to exit. Before the drifting may begin, OCC must be notified of the situation and planned remedy. It may be necessary to wait for the elevator/escalator mechanic if fire and rescue efforts are not immediately successful. If an elevator/escalator is taken out-of-service for any reason, do not return it to service. An elevator/escalator mechanic must inspect the unit before it returns to service.

Equipment suggested for these types of incidents includes: elevator keys, poling tool, portable lighting and Metro maps.

Escalators. Units responding to entrapments involving escalators should be prepared for aggressive removal of mechanical and structural parts. The most typical entrapments include clothing caught in the comb plates or side panels, or limbs caught in the comb plates or side panels. Entrapments within escalators are usually true emergencies and require swift and immediate rescue.

Steps to follow are:

- Determine which escalator is involved.
- If the escalator is still operating, stop it immediately by either key or stop button.
- Disconnect main power for involved unit.
- Lockout/tag out unit.
- If the situation is a life or death emergency, strike the step, one step away from the victim, with a sledgehammer or maul.
- If the comb plates are trapping the victim, they can be removed by striking them with a striking tool.
- The steps can be removed by using a long (12") Allen key or screwdriver.
- The comb plates can be removed with the use of a large flat blade screwdriver.

If an escalator is taken out-of-service for any reason, do not return it to service. An elevator/escalator mechanic must inspect the escalator.

Rescues from Trains. It is impossible to predict all of the possible entrapments that could occur within the Metro system. Therefore, only the most probable and those that have occurred will be discussed.

Person Trapped Under Train. It is not at all uncommon to respond to a person trapped under a train. The most common form of suicide and suicide attempts involve the victim intentionally placing themselves in the pathway of a train.

Rarely is the incident the result of an accidental push or fall from the platform. As ridership grows and the platforms become more crowded, this may change.

The line between a fatal event and a viable patient is determined by the physical characteristics of the victim, the speed of the train, the impact point with the train, the number of cars that pass over, any track or right-of-way structures the victim impacted with, and what part or parts of the body are run over by the train.

The level of coordination to resolve this incident will be fairly high. The actions taken to resolve this incident will vary depending upon whether or not the victim is viable. There are three possible scenarios:

1. The victim is deceased.
2. The victim is viable with no impingement.
3. The victim is viable with impingement.

The rail car lifting procedure used to free the victim. The following equipment will be needed:

1. 2 Metro bags.
2. 1 complete air bag system and two air bags (the largest available).
3. Wood cribbing.
4. Wedges.
5. Portable lighting.

Steps in rail car lifting:

1. Confirm power removal, it must be Red Tagged by Metro.
2. Discharge capacitors, if applicable.
3. Install WSADs.
4. Confirm the location of the victim. It is possible that the victim may be ahead of the train in the track bed or under platform refuge area.
5. Confirm that the mechanical brake on the lead and tail railcars have been set by Metro.
6. Metro wheel chocks must be placed at the outer most wheels of the train.
7. Locate the victim and determine viability.
8. If the victim is deceased, no rail car lifting will occur and fire department actions are concluded. Transit Police take over at this point.
9. If the victim is viable and impinged or in a position that does not allow easy removal, then a lift of the rail car is required.
10. Box cribbing must be set up under the truck assembly either in the center of the truck for a whole car lift or under one side for a single side lift.
11. Crib from the track bed up to the bottom of the truck, leaving only enough room for two airbags to fit. Ensure that the victim removal route is clear.
12. Inflate the airbags only to the point where the victim is no longer impinged.
13. Remove the victim.
14. Ensure that all personnel are clear of the lift area and lower the rail car.

Person Trapped Between Rail Cars. The probability of this type of entrapment occurring is very slim. Metro does not couple trains with personnel on the ground in the area of this activity. Nor are rail cars drifted to each other to couple. The operator must be in the cab to drive one car to couple with another.

If it does occur, it would most likely occur in the car repair shop. Because cars in the shop are sometimes moved by other than their own power, it is possible that a mechanic could end up between two rail cars. This is another situation where despite the gallant efforts by rescue personnel, the victim will almost immediately expire. If the victim in impinged by the coupler of both pieces of equipment through the torso, then death is imminent.

The procedure for rescuing this victim is simple. The mechanical brake must be set on one rail car. Third rail shall be de-energized. The car without the brake set must be pulled away from the other. Once this is completed, aggressive medical treatment must begin.

Person Trapped Between Rail Car and Station Platform. Of all the possible entrapments in the Metro System, this one will be the most unnerving if the victim is trapped by more than just a limb.

The victim will be alive, and doing well for the most part; however, once they are released from the entrapment, they will expire. This is referred to as the 'Crush Syndrome'. The pressure of the train against the body will cause the platform to become a tourniquet. The procedure for removing someone from this entrapment will require time and patience, and unfortunately it will most likely result in death of the victim.

If the victim's body is trapped at the waist, relieving the pressure from the train will result in their death. If limbs only are trapped, emergency amputation may be required to prevent systemic poisoning and death. The usual cause for someone being in this position is jumping or otherwise placing oneself in front of a moving train or placing oneself between the rail cars as they prepare to move.

The procedure used to free the victim is known as lateral jacking from platform. Medical treatment will not be covered here.

The following equipment will be needed:

- 2 pair Metro wheel chocks.
- 1 complete air bag system and two air bags, minimum lift of 5 inches.
- Wood cribbing –4x4 or larger, two step chocks.
- Wedges.
- Portable lighting.
- Personnel from four units plus EMS.
- WSAD.

The station platform must be cleared of all personnel not directly involved in the dis-entrapment and especially any media.

Personnel placement:

- One at each air bag.
- One at each step chock/cribbing.
- One in the refuge area under the platform to assist with the victim movement.
- One in the track bed in front of the train to observe the train wheels for possible derailment.
- One on the opposite side of the train at center platform stations to insure that the car does not come in contact with the station wall.
- One at the coupling between cars to ensure that the cars do not contact each other during the jacking.
- One to observe the top of the car if the incident is in a tunnel.

The mechanical brake on the lead and tail rail cars must be set by Metro. The third rail must be taken down and the WSAD put in place. Metro wheel chocks must be placed at the outermost wheels of the train.

Disable the air bellows leveling system on the 2000, 3000, and 4000 series cars. This is done by turning the handle at the front of the car a quarter turn. For the 5000 series, the valve is located near the truck assembly. WMATA personnel would be of great assistance for this procedure.

Place wood wedges between the rail car and platform to prevent additional pressure placed on the victim. If step chocks are available, they are a better option than wedges or cribbing. The step chocks should be placed with the base toward the rail car. Determine the removal point for the victim. The victim will most likely need to be slid out towards the end of the car.

Place the airbags with the center mark just below the platform at the truck assembly but not in the exit pathway for the victim. The center of the bag must be just below the platform edge, in line with the rail car floor. Place the cribbing/step chocks in the gap as the air bags inflate to hold the car away from the platform. As the car is jacked from the platform, either raise the victim up and out of the gap, or slide the victim to the opening. Personnel watching the train movement should call for the jacking to be stopped immediately if the car approaches derailment or contact with other cars or objects.

Do not release the jacked rail car until the police investigation is complete or directed to do so by Transit Police. Once cleared, remove the fire department equipment. Do not restore the rail car systems. Metro's re-rail crew may be able to assist with the jacking of a car from the platform. They have hydraulic equipment that can safely move a car sideways. Their procedures can minimize the potential harm and damage if an air bag were to fail.

Person Trapped Within Rail Cars or Track Equipment. Depending on the exact situation causing the entrapment, rescue may require more ingenuity than equipment. Hydraulic rescue tools are not effective against the exterior of most rail equipment.

Personnel may be required to use small electric or hand tools. Other equipment such as the 'slice pack' may be beneficial. Hydraulic rescue tools may be effective on the interior of the cars and track equipment.

Rescue from Train Repair Equipment. Metro uses a wide variety of heavy equipment to manipulate and repair rail cars. The greatest reference for relieving an entrapment would be the employees that use the equipment. Primary among the tasks to free the victim would be to stop the process that caused the entrapment and to remove the power supply to the equipment. It may be necessary to use other heavy equipment at the shop or site to assist in the operations.

Rescue Train. In the event of an emergency within the system, Metro will attempt to mitigate the situation prior to the fire and rescue services' arrival. If the emergency requires the removal of passengers from a train that is not at a station, Metro will dispatch a rescue train to the incident location. This train may or may not arrive prior to the fire and rescue service. If it does arrive first, Metro will evacuate passengers from the affected train to the rescue train. If there are

injured passengers that cannot be moved, Metro will leave someone on board the incident train until fire and rescue units arrive.

The third rail must be energized in order for the rescue train to approach the scene. The rescue train can be placed on the adjacent track. Passengers evacuating the incident train must step down to the track bed before entering the rescue train. If they are allowed to cross directly from one train the other, contacting both trains simultaneously, they could be energized.

If the rescue train is on the same track, it should be stopped prior to coupling with the incident train. The incident commander can request this train for the purpose of evacuating passengers, as transportation to the incident location, or to be used as an observation platform.

Recovery Train. In the event that a train stalls on the right-of-way outside of a station, Metro will dispatch a recovery train to assist in the removal of the disabled train. The equipment sent will vary depending on the reason for the disability. If the problem is within the third rail power, then the equipment sent will most likely be a diesel locomotive. If the problem is car borne, then a passenger train will be sent.

If a recovery train cannot be sent in a reasonable amount of time, Metro may request that the fire and rescue services assist with the evacuation of the train to waiting transportation. The waiting transportation is normally buses.

When providing this assistance the following procedure will be in place:

1. The fire and rescue services will access the train via the closest right-of-way gate provided that the gate is at least ten feet beyond the end of the train. Passengers will not be removed out a side door and directly through a R.O.W. gate. Passengers shall be removed through the end doors, brought to the track bed, and then exited through the R.O.W. gate.
2. If the end doors are not available, then the passengers must be assisted out of the rail car through door #9 toward the opposite track, preferably where there is a gap in the third rail. In this situation, the third rail will be confirmed down for the entire evacuation route and WSAD's will be in place.
3. If the decision made is to walk the passengers to the nearest station, the fire and rescue service will enter from that station and escort the passengers back.
4. The third rail will be confirmed down for the entire evacuation route and WSAD's will be in place.

RESPONSES TO UNUSUAL EVENTS

Confined Space Operations

The Metro System is constructed with multiple types of confining areas. Some of these areas fall into the category of confined spaces and require permits to enter. Others, though they do not require permits to enter, are confining. Metro employees treat most of these as if they were confined spaces. There are several groups of employees at Metro that are certified in confined

space operations. These employees may be available should there be an incident within the system.

If the department were to be called to a confined space or confining area incident, they should treat the incident accordingly, using teams of rescuers, tag lines, PPV, other positive contact equipment, and call for additional resources as necessary.

Structural Collapse

The likelihood of a structural collapse in the Metro system is very slim without the aid of an external device. The system is designed to withstand the forces of a train impacting support members or structures. However, not all possibilities can be calculated. If there were a collapse of a tunnel or aerial section, or a station, third rail power should be the first concern. Immediate steps should be taken to remove any and all power in the area of the collapse. The next step would be to determine if there are any passengers or employees trapped in the area.

A structural collapse team must be called to shore up the area. Because many of the underground areas are at levels of 100 or more feet underground, a top down approach may not be practical. The assistance of mining specialist may be required to rescue those trapped. Because Metro travels under many structures, the stability of those structures should be of paramount concern. A collapse of one of the tunnels under either river would result in the flooding of major portions of the underground system as well as significant marine issues. The response strategies would be based upon the situations discovered by the rescuers.

NON-ELECTRIC TRACK EQUIPMENT

Metro operates a fleet of specialized equipment necessary for the maintaining the rails, rail cars, and right-of-ways. Much of this equipment is diesel powered. In many cases, the maintenance that these vehicles provide cannot be completed with the third rail energized. This equipment includes modified railroad locomotives and maintenance units.

Each of the yard facilities has several types of equipment assigned to them. They include hi-rail vehicles (highway vehicles with railroad wheel attached), diesel-electric locomotives, flat cars, and specialized track and right-of-way machines. If this equipment is needed for use at an incident, it must be called for early due to the extended response times.

Special Rescue Equipment

Metro has equipped its stations and the fire and rescue services with specialized equipment to be used within the system in the event of an emergency. This equipment includes Emergency Tunnel Evacuation Carts (at stations), Warning Strobe and Alarm Devices (on some fire units and in transit police vehicles), and Hot Stick Voltage Probes (on some fire units).

ETEC Carts. The Emergency Tunnel Evacuation Cart is used to remove non-ambulatory passengers from the site of an incident, Figure 15. The ETEC can handle four passengers on backboards, two on the top and two on the bottom.

Figure 15 – ETEC Cart.

Fire and rescue equipment can also be loaded on to the cart for transport to the scene. The maximum load to be placed on the top level is 250 pounds.

The ETEC fits on the running rails and is controlled by a deadman brake. By lifting the deadman brake, and holding it against the push bar, you can roll the ETEC to the closest exit or station to evacuate non-ambulatory passengers.

The ETEC's are located throughout the Metro system; at stations, tunnel portals, as well as some vent, fan, or emergency exit shafts. The cart is normally scissored into the down position for storage and chained to a wall or kept in a storage cabinet. When an ETEC is placed on the tracks, the upper deck should be raised and secured. The upper deck is secured in the up position by turning the locking levers on the lower level.

Warning Strobe and Alarm Device (WSAD). The Warning Strobe and Alarm Device (WSAD) is designed to give an audible and visual warning should electricity be detected in what should otherwise be de-energized third rail. This device is designed to be placed at a distance no greater than 500 feet from the end on the incident or emergency.

The WSAD will activate when installed on an energized third rail, if it is installed incorrectly, or if the batteries are low. The WSAD will also begin alarming at 50 to 60 volts, which is the same voltage that stray current has been measured.

WSAD's are carried by a variety of fire and rescue vehicles within the Metro Transit Region, as well as several Metro Transit Police vehicles. The Metro Transit Police Officers do not place the WSAD's in service; rather, they make them available should the fire and rescue service need additional units for the incident. Every incident requiring the WSAD will require a minimum of two units. The new model WSAD must be opened to play out the wire for the paddles.

Figure 16 – Installing WSAD.

WSAD Installation Procedure, Figure 16:

1. Contact OCC to have the third rail de-energized.
2. Test the third rail with either a hot stick or volt probe to ensure that the power has been removed.
3. Test the siren and strobe on unit.
4. Place the WSAD in the upright position between the

third rail and the running rail.

5. Place the white 'ground' paddle on the running rail. An indicator light will turn on if the contact is good. If good contact is not achieved, the running rail can be scraped free of rust with the scraper attached to the white 'ground' paddle. After the scraping, re-install the white 'ground' paddle.
6. Place the red 'T' shaped paddle on the third rail.
7. An indicator light will turn on if the contact is good. If the contact is not good, remove the paddle and replace it a few inches away. **DO NOT UNDER ANY CIRCUMSTANCES SCRAPE THE THIRD RAIL!**
8. Lay the WSAD down with the **siren facing the incident, not the rails**. Both models must be laid down to turn on. Failure to do so will drain the batteries and cause the unit to fail. Depending on the model used, the indicator lights will turn off or stay on when installation is complete and correct.

Removal Procedure:

1. The removal procedure is the reverse of the installation procedure.
2. Setup the unit between the third rail and running rail.
3. Remove the red paddle from the third rail and place it in its storage position.
4. Remove the white paddle from the running rail and place it in its storage position.
5. Remove the WSAD from the track and return it to service. If the WSAD activated while attached to the rail or failed during set up or testing, it must be sent to Metro via the Department's Rail Liaison for testing and calibration.

Knopp Voltage Tester (Hot Stick). The Knopp Voltage Tester (Hot Stick), Figure 17, is a hand held voltage–testing device used to test the third rail for the presence or absence of electrical current. These devices, which were provided to the fire and rescue services by Metro, provide the same function as the volt probe but with greater accuracy and safety.

The Washington Metropolitan Area Transit Authority (Metro) is providing The Knopp Model 4E2-1 Voltage Tester (Hot Stick) to area fire departments for testing the third rail. The hot stick is designed especially to detect electrical potential between the third rail and ground on high voltage electrified transit systems. This unit can be used on either AC or DC current with voltages up to 1500 volts. The Hot Stick has dual neon lamps and two independent circuits to indicate the presence of voltage. It also provides a double safety protection to the operator. Another safety feature is the limitation of current through the test circuit. It allows less than 3 milliamperes at 1500 volts.

Figure 17 – Hot stick.

The probe handle and tester housing, with rubber hand guard, are made from moisture and oil-resistant laminate phenolic. The probes are detailed to match the colors of the paddles on The Warning Strobe and Alarm Device (WSAD). The probe that is used to make contact with the third rail has red reflective tape near the tip. The probe that contacts the running rail/ground has white reflective tape near the tip.

NOTE: The Hot Stick **will replace** the Volt Probe and Phenolic Rod for the purpose of testing the third rail. However, the Volt Probe shall remain on the apparatus and can be used as a secondary tester if needed.

Testing Procedure (Prior to Third Rail Operations) **Because of the design of the tips, this testing procedure is reverse of the operating procedure.**

1. Place the large probe tip into the center hole of a three-prong outlet.
2. Place the short probe tip into the side of the three-prong outlet making sure that the flat sides are parallel to the slot in the outlet.
3. Look in the observation windows to observe the neon power indication lights.
4. If the neon bulbs do not light on the initial test, place the tip of the short probe into the other slot on the outlet.

Operating Procedures - Testing Third Rail:

1. Test the Hot Stick in a known electrical source (electrical outlet, vehicle generator).
2. Grasp the small probe handle just in front of rubber boot (near the rear end of handle). This probe has white reflective tape.
3. Grasp the large probe handle immediately behind the rubber hand guard ring located approximately 4 ½ inches from the rear end of the handle. Hold the handle so that the neon bulbs can be seen through the viewing ports in the handle.
4. Kneel or stoop between the running rails, not facing the third rail.
5. Place the small probe tip on the running rail.
6. Place the large probe tip on the third rail. **NOTE:** Minimal contact pressure is required.
7. Observe the neon bulbs:
    - If bulbs are lit, the third rail is energized.
    - If bulbs are not lit, remove the large (third rail) probe tip and retest a short distance (inches) away.

Removal Procedure:

1. Remove the large probe tip from the third rail
2. Remove the small probe tip from the running rail. **NOTE: Do not** remove both tips at the same time!
3. Retest the Hot stick in a known electrical source
4. If the neon bulbs light up, then it worked during the test of the third rail
5. Report the results of the third rail test

> **NOTE:** This operating procedure must be preceded by a call to OCC to have power removed from the third rail. Our purpose here is to conduct a **negative test**, to test for the absence of third rail power.

Metrorail Emergency Response Maps. WMATA has provided all of the region fire and rescue departments with Emergency Response Maps for their portion of the Metro System, Figure 18. These maps cover all sections of the Metro right-of-way including stations, fire zones, tracks, bridges, tunnels, yards, R.O.W. gates, chain markers, and common corridors, as well as locations of fire hydrants, local streets, ancillary buildings, fire protection systems, and terrain.

These maps are found on all suppression apparatus, command apparatus, Transit Police vehicle, Fire Communications, POD, and at all Metro and fire stations. When responding to any incident involving Metro or on Metro property, personnel should reference these maps to ensure that the response is to the correct location. Although some alarms are tied to a particular station, the facility with the problem may be up to a half mile away.

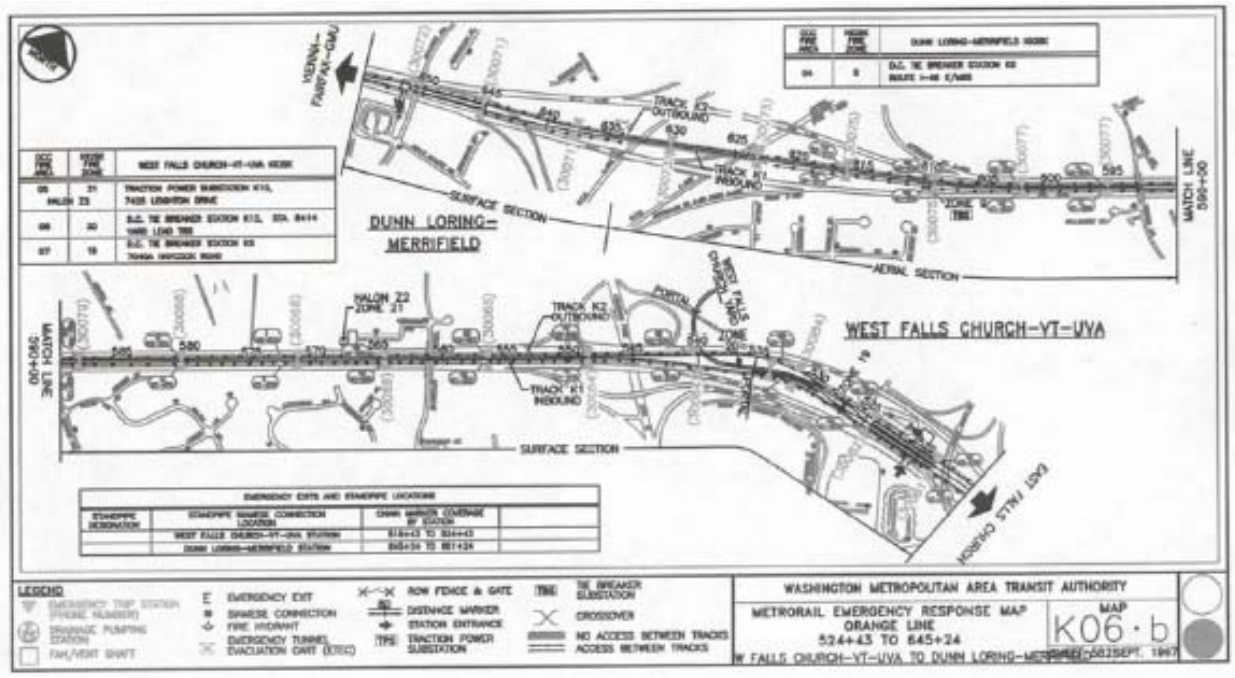

Figure 18 – Metrorail emergency response map.

SAFETY

To the uninformed and untrained rescue worker, the Metro system can be a foreign and hostile environment. All department members must maintain a basic working knowledge of the system to ensure their safety. Some general safety rules that all personnel must adhere to are:

- All personnel entering any Metro right-of-way shall wear the appropriate personal protective equipment for the type of incident that they are responding to.
- Personnel operating in the right-of-way shall always be watching for unexpected train movement. Be aware that an approaching train may not be readily heard. A moving train is the greatest hazard on the railroad.
- Always treat the third rail as if it were energized.
- Never touch the third rail, even if it has been confirmed de-energized.
- A Warning Strobe and Alarm Device (WSAD) will not protect you from electrical shock if you are in contact with the third rail. It can only warn you that it has detected enough power in the third rail to cause harm and that the amount of power detected can approach a lethal level.
- No one shall enter the track bed until all of the following provisions have been met:
  - Permission has been granted by the Incident Commander
  - Metro OCC has confirmed that all power has been removed and all train movement in the immediate area has stopped.

- The third rail has been tested by fire department personnel using the volt probe or hot stick
- The circuit at the closest ETS box may not control the individual sections of third rail. Each section of third rail in the area of the incident and along the exit/travel route for fire and rescue personnel and passengers must be independently tested and confirmed down.
- Never touch a third rail current collector paddle 'pick up shoe' on any car.
- No one shall work alone in any right-of-way.
- Personnel shall not enter any right-of-way gate, exit shaft, or access any part of the right-of-way without permission from and coordination with OCC. This includes (but not limited to) for the purpose of inspecting the system, tours, and emergency calls.

'PROTECT' SYSTEM/CB-EMIS

The "Protect" system is the chemical and biological substance detection system installed in WMATA Rail stations that are located in sensitive areas of the DC Region. This system uses specialized detectors to sample volumes of air and detect the presence of specific agents. This system alerts WMATA OCC who will in turn notify the appropriate fire/rescue agency of the system activation. CB-EMIS is the system that manages the information received from the PROTECT detectors.

APPENDIX A – DEFINITIONS

This list is not intended to be the sole listing of terms used within the Metro System. It is compiled to define the terms most relevant to fire and rescue operations.

Accelerator Rail (Kicker): A short section of third rail found just beyond some station platforms, to ensure uniform train acceleration.

AC Switch Board Room: One or more rooms in all Metro stations wherein electricity from the utility company is received and distributed for station and right-of-way use.

Aerial Structure: Any portion of the right-of-way above the level of the surrounding terrain usually supported on columns spanned by concrete or steal beams.

Amber-Amber: The Metro radio system code designation for a fire.

Ancillary Rooms: Rooms in or near a rail station containing mechanical equipment or service facilities, and where most smoke and heat detectors are located.

At-Grade: (surface) the track or station constructed at or near the surrounding ground surface level.

Ballast: The coarse gravel that forms a bed for a railroad, for the purpose of creating a surface to hold the track in line.

Black-Black: The Metro radio system code designation for a collision or derailment.

Blue-Blue: The Metro radio system code designation for a Hazardous Material, WMD, or unknown type emergency in a station, on a train, bus, building, or on the right-of-way.

Blue Light Station (ETS): See Emergency Trip Station.

Bulkhead Door: The door on the end of a rail car used for employee passage from car-to-car or for disembarking between stations during emergencies.

Bi-directional (Two Directional): A means of approaching the incident scene from opposite directions. This method is required and especially effective for incidents on aerial structures, in tunnels, and when the exact location is not clear.

CB-EMIS or Chemical Biological Emergency Management Information System: The program system that manages the information received from the PROTECT detectors.

Chain Marker: A measurement system sign displayed every 100 feet along the right-of-way. The sign denotes the distance in feet from the HUB, the center point of the line (either Metro Center or Gallery Place). A chain marker written as “K2 [color] 525+00” would be read as “K” line, track 2, Orange Line, 52,500 feet from the HUB. The signs appear between the tracks or are

affixed to the fence along the at-grade or elevated right-of-way, or mounted on the walls of the tunnels throughout the Metro system. Chain markers may also be found on ancillary buildings or rooms as a means of fixing their location within the system.

Chopper Cars: 3000 and 4000 series rail cars that employ regenerative braking.

Collector Shoe/Paddle: The car-borne device designed to slide on the third rail to pick up DC propulsion current. The collector shoes are located in the center of each truck assembly on each side, four shoes per rail car.

Common Corridor: The shared transportation right-of-way where MetroRail runs in the median strip of an interstate highway or adjacent to, above, or between railroad tracks belonging to other railroad systems.

Conference Line: Capability of the telephone system to allow a number of parties to hold a conversation by telephone, on the same phone line, from phones within or outside of the Metro system.

Consist: A railroad term that denotes the number of rail cars in a train. A six car consist is three married pairs of rail cars under the control of one operator.

Coupler: A mechanical device on each end of a rail car used to connect one car to another.

Cover Board: The gray fiberglass-like material over the top of the third rail. It is an insulator and provides some protection from inadvertent contact with the third rail.

Dynamic Braking: A method of train braking where kinetic energy from train movement generates current at the traction motors, and is dissipated by the resistor grids.

Elevated Right-Of-Way: The portion of track constructed above the adjacent ground surface (Aerial Structures and Stations).

Emergency Exit: A passage consisting of stairs to the surface with a hatch or door to the outside. This exit is located in the vent shaft farthest from the normal exit in a single-entry station, and in vent, fan, or emergency exit shafts between stations. Except in special cases, the travel distance to an emergency exit does not exceed 1,250 feet.

Emergency Response Maps: Computer generated map of the Metrorail system showing the right-of-way superimposed on area streets and providing details of system features such as stations and associated structures.

Emergency Trip Station (ETS): Boxes or cabinets located approximately every 800 feet along the right-of-way and at the ends of station platforms. These boxes contain a telephone for communicating with Operations Control Center (OCC), an Emergency Trip Switch (button) to de-activate third rail power, and a power graphics map for identifying the sections of the third rail affected by this particular ETS. They are identified by a blue light on top of the box or cabinet.

Fan Shaft: A concrete structure with reversible fans at or near track level, having a grate at surface level used to exhaust heat or smoke mechanically from the tunnels or to supply fresh air. They are found between subsurface stations along the Metrorail system.

Fare Gate: The machine at the entrance to the passenger stations that records information and collects fare from the fare card as a patron enters and exits the system.

Graphics: Information signs throughout the Metro system.

Gray-Gray: The Metro radio system code designation for smoke in a rail car or in a station.

Hot Stick: A hand held voltage-testing device used to test the third rail for the presence of electrical current. This device is carried by Metro employees and on some fire and rescue vehicles.

Inbound: The direction toward chain marker 0+00 (the hub of the line). It is track #1 on the A, C, F, J, K, and L Lines and track #2 on the B, D, E and G Lines.

Incident Commander: The individual in charge of the fire and rescue personnel and operations at the scene of an emergency.

Interlocking: See Switch.

Interlocking Equipment Box: A fire-extinguisher style box for the storage of switch blocks (chocks), cranks, hammers and switch point clamps, as required near the switches in interlocking and yards.

Intrusion, Detection and Warning (IDW): The system that detects damage to the anti-personnel fence or partition, by zone. The IDW is installed in common corridor areas.

Inverter: A device, which converts battery power to AC energy, or in Rohr (1000/8000 series) cars, converts third rail power (750 volts DC) to AC energy to power the traction motors.

Jacking: See Lateral Jacking.

Kicker Rail: See Accelerator Rail.

Kiosk: The station manager's control point in a subway station. It contains the annunciator panel and fire zone schematics showing the location of all heat/smoke detector zones associated with that station; telephones connected to OCC; a public address system capable of making announcements in the station, and controls for the elevators and monitors for the escalators in the station.

Knox Box: A secure box normally mounted on the first flat wall to the right as you enter a Metro station near its security gate. The box contains keys for that Metro station, and is accessible by a key carried on the fire and rescue vehicles. For stations that straddle jurisdictional boundary lines, a Knox Box will be present for each jurisdiction's access keys.

Lateral Jacking: The process of moving a rail car away from the platform to free a trapped victim. Air bags are normally used in the procedure.

Married Pair: Two MetroRail cars semi-permanently coupled together. This is the minimum number of cars required for operation of a Metro train.

Metro Transit-Police (MTP): The WMATA police force. Sworn police officers with the primary jurisdiction in the Metro system and responsible for handling crimes against WMATA property, passengers, or employees.

Mezzanine: That portion of a Metrorail station containing the Kiosk and fare gates. The mezzanine may be on a level above the platform (in underground stations), below the platform level (for aerial stations), or above or below the platform level for at grade stations.

Negative Return Rail: The running rail that is electrically connected by means of a negative return bond (referred to as the propulsion return rail or ground rail) to the traction power substation.

No Clearance Area: An area where the minimum safe distance between all points on a moving vehicle and fixed wayside structure or appurtenance is not sufficient to allow personnel to occupy this area during passage of a train.

On-Scene Commander: A Metro term for the ranking Metro employee on the scene of an emergency incident. This person will normally be a transit police officer.

Operating Personnel (Employees): Those Metro employees having direct and supervisory responsibility for the movement of trains, including both onboard and wayside duties.

Operations Control Center (OCC): The terminus for automatic train control information, trouble alarms, and radio transmissions. Staffed by OCC WMATA supervisors and vital to the operation of the Metro system, it is often referred to as “Train Control” or “Central Control”.

Outbound: The direction away from the chain marker 0+00 on any given line. It is track #1 on the B, D, E, and G Lines and track #2 on the A, C, F, J, K, and L Lines.

PABX: “Private Automatic Branch Exchange” telephones found in station service rooms and the Kiosk. They allow access to OCC by dialing a four-digit phone number.

Phenolic Rod: A non-conducting, 36” rod that fits into the volt probe. This rod allows the probe user to be at a greater distance from the third rail when testing it and also allows for greater control of the volt probe.

Platform: The level within a Metro station where passengers await trains, embark and disembark. The platform may be above, below, or at the same level as the mezzanine level, depending upon the configuration of the station.

Pocket Track: An interlocking arrangement in which a third track is connected to mainline tracks (track #1 and #2) used for storage and/or turning (reversing direction) trains.

Portal: A point where the right-of-way enters or exits a tunnel.

Power Pick-Up Shoe/Paddle: The metal paddle extending from each side of the truck (wheel assembly) of a rail car. There are four per Metro car. This shoe contacts the top of the third rail to transmit electricity to the train motors.

"Power Down": The term used by Metro to indicate that the third rail power is being removed.

"Power Up": The term used by Metro to indicate that the third rail power is being restored.

'Protect' System: The chemical and biological substance detection system installed in WMATA Rail stations that are located in sensitive areas of the DC Region. See CB-EMIS.

Purple-Purple: The Metro radio system code designation for a person jumping into the track bed or a person struck by a train.

Rack-Out: To remove an electrical circuit breaker from its installed position in a cubicle, so that it cannot be inadvertently closed restoring power.

Recovery Train: A train used to couple to a disabled train for the purpose of either pushing or pulling the disabled train off of the mainline tracks.

Red Tag Third Rail Power Removal: The procedure of removing third rail power by physically disengaging large circuit breakers in Traction Power Substations and/or Tie Breaker stations. This procedure is referred to as 'racking out the breakers'. The reinstallation of these breakers requires the approval of the Fire and Rescue Incident Commander once all fire and rescue personnel have cleared the right-of-way.

Regenerative Breaking: Breaking mode of electric trains, whereby the motors act as generators as with the dynamic braking, but instead of being converted into heat, the current is fed back to the supply.

Rescue Train: A train commandeered for the purpose of removing passengers from a disabled train. The Fire and Rescue Incident Commander and OCC must concur on allowing the third rail to remain energized to facilitate this operation.

Revenue Area: Parts of the Metro system where paying passengers may be at any time. These areas include stations, tunnels, surface and aerial right-of-ways. The rail yards and yard lead track are not included.

'Ribbon Rail': Steel rail that has been manufactured or welded in lengths of up to one half mile or more. This rail has a tendency to recoil to its designed position if it is broken or separated in a derailment. There will be little or no warning before it recoils.

Right-Of-Way (ROW): The area considered to be the space inside the tunnel walls, at-grade between the fences or between the railings on aerial structures.

Running Rails: The rails that the trains ride on and serve as the negative side or return for the third rail electric traction power system.

Single Tracking: An operation performed during any incident involving the blockage of one track in the system when Metro attempts to route all traffic, both inbound and outbound, to the track that is not involved. Trains running in the wrong direction are sometimes referred to as wrong railing.

Station: A place designed for the purpose of loading and unloading passengers.

Station Manager: A Metro employee assigned to each station to monitor equipment and systems, and to assist passengers. A station manager is assigned to each Kiosk in a station.

Stray Current: An occurrence where the negative return in the traction power electrical system reaches earth ground. High resistance in the return of the negative current may cause this, or when some metal object comes in contact with a rail car or the running rails.

Supervisory Power Removal: Third rail power removed remotely by OCC, via computer.

Switch (Crossover Track): A pair of switch points with their fastenings and operating rods providing a means for establishing a route from one track to another.

Third Rail: The rail that provides electrical power of approximately 750 volts DC to the trains. It is located outside of the running rails and slightly higher (approximately 4 ½ inches) than the running rails and is protected by a fiberglass cover board.

Tie-Breaker Station: Circuit breaker facilities for traction power, located approximately ½ mile from the traction power substation.

Traction Motor: The electric propulsion motors mounted to each axle of each truck of a rail car.

Traction Power: The 750 volts DC third rail electrical power system used to propel the trains.

Traction Power Substation (TPSS): Electrical power centers located approximately every mile along the right-of-way, where electricity is received from the local power company, converted to DC current, and distributed to the third rail.

Train: A single married pair or multiple pairs coupled together to form a single unit.

Train Line Current: A continuous set of electric conductors containing 37½ volts power, extending between cars from the first car to the last car, allowing power or control signals to be transmitted to and from each car, permitting simultaneous control of traction motors, brakes, communications, doors, and other vehicle carried equipment.

Train Control Room: An ancillary room located in a passenger station to house wayside Automatic Train Control equipment.

Train Operator: The Metro employee responsible for the operation of the train.

Train Room: The area of a station where the train stops in order to discharge and pick up passengers.

Transit Car (Rail Car): An electrically propelled rail vehicle characterized by high acceleration and braking rates for frequent stops, and fast loading and unloading.

Truck: On transit cars a truck is one of the two complete assemblies, which includes axels, wheels, brakes, traction motors, collector shoes, etc. They also provide support, mobility and guidance for the car.

Under Platform Exhaust (**UPE):** The portion of the ventilation system, found in underground stations, consisting of air ducts terminating under the platform at track level and at the surface. Generally, they contain reversible fans to allow fresh air to be introduced or heat/smoke to be exhausted.

Vent Shaft: A concrete air exhaust structure with movable louvers at track level and a grate at the surface. They are always within 100 feet of the ends of subsurface stations and sometimes found between stations. They contain stairs or ladders to reach the surface and can be use in emergencies for evacuation.

Volt Probe: A portable handheld instrument used to check the third rail to detect whether or not electrical power is present, or to confirm that third rail power is shut down.

Wayside Telephones (ETS): Telephones found in blue, light boxes and in some service rooms and fan shafts. These phones allow contact with OCC.

Warning Strobe and Alarm Device (WSAD): An instrument used to detect whether or not third rail power has been reenergized in an emergency or work area. The WSAD gives a visual and audible warning if power has been detected in the third rail.

Washington Metropolitan Area Transit Authority (WMATA): The organization created by legislative action to plan, build, and operates the Metrorail rapid rail transit system in the region.

Yard: A system of tracks and facilities of defined limits (outside of the revenue system) used for the makeup of trains, car storage, repair, and inspections.

Yardmaster: The rail operations supervisor assigned to the yard. This supervisor is in charge of all activities in the yard. The Yardmaster controls all third rail power and train movements within the yard.

APPENDIX B – SPECIAL RESPONSE SITUATIONS

Responses to the following locations will differ from the standard responses located elsewhere in this document.

West Falls Church Station Water Supply

The standpipe connection for this station is located in the bus loop on the north side of the station. Access to the bus loop for fire apparatus is via the Dulles Access Road. Depending on the response position, either the first or second engine must use the bus loop to connect to the system. If no engine is able to access the bus loop, supply lines must be hand carried to the first standpipe outlet near the main entrance.

Alexandria City Tunnels

The first arriving unit will establish command and contact OCC to remove power to the entire tunnel. After receiving confirmation that all rail traffic has ceased and power has been removed, the recon team(s) will verify the removal of power and the location of the incident. Water supply engines will connect to the system using dual lines and charge the system if smoke or fire is showing or on orders of command.

C/J Junction. The C/J Junction is located south of the King Street Station. This is the most complicated tunnel array in the system. There are five non-interconnecting tunnels. Ref. Metrorail Emergency Response Maps, I-1.

- Verifying the correct location is top priority.
- Any incident in this location will require a minimum of four entry teams when reported on either the ‘C’ or ‘J’ line.
- If the incident is reported to be at the C & J junction with no further information, then a minimum of six two-person teams will be needed to verify the location.
- This location alarms as Eisenhower Station zone 13-16.
- The first arriving engine and truck will locate at the Englehardt Street stairwell.
- The second arriving engine and truck will stage on Mill Road.
- The third and fourth engines will locate at the King Street Metro Station.
- All other units will stage on Duke Street unless otherwise directed.
- OCC will be notified via the wayside phone that all rail traffic on both lines must be stopped until the location can be verified.
- Command will determine which tunnels to investigate.
- Command will determine which tunnels can be returned to service safely.

Braddock Road Tunnel.

- The first arriving engine will locate at the fan shaft off Slaters Lane, connect to the standpipe system, and send a crew of two into the shaft leading to the tunnel to locate the incident.
- The first arriving officer will contact Metro OCC via the wayside phone before entering the tunnel. Fire Communications will dial into the conference line. Personnel operating on the incident shall also dial into the conference line.

- The incident commander will request that OCC remove power to the third rail before the location is verified. Use of the Blue Light stations to remove the power should occur only if there is an immediate life safety issue.
- The second arriving engine will stage with the first arriving engine at Slatters Lane.
- The third arriving engine and the first arriving truck will stage at the south portal unless directed elsewhere.
- The fourth arriving engine and the second arriving truck will stage at the north portal unless directed otherwise.
- Command will provide a staging location for any additional units.
- One two-person team will enter the tunnel from each end and move toward the center until the incident is located. All other personnel will stage at the portals until otherwise directed by command. The investigating crews will verify that all rail traffic has ceased before walking in the trackbed.

Arlington Tunnel Radio Channel

Arlington County will assign different radio channels for subsurface incidents within their jurisdiction. ECC will assign an operations channel (1-B, C, or D) and an underground fleet: 9-A (which is also 1-N), B, or C.

Portable radios will operate on the operations channel until they enter the underground portion of the system. Upon entering the underground portion of the system radios shall be changed to the assigned underground fleet. Mobile radios are to remain on the assigned operations channel.

APPENDIX C – WMATA SPECIAL ORDERS

Washington Metropolitan Area Transit Authority

SPECIAL ORDER

NO. 01-04 DATE: October 18, 2001

TO: RAIL - OCC

SPECIAL ORDER 01-04

This Special Order creates SOP #35 titled "HAZARDOUS MATERIAL INCIDENT" and creates the radio code "Blue Blue" to identify such an incident.

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

INTERIM SOP #35 - HAZARDOUS MATERIAL INCIDENT

35.1 DESCRIPTION

Upon OCC or MTPD receiving notice of a hazardous material release, the incident will be coded as a Blue, Blue Incident.

35.2 NOTIFICATION OF A HAZARDOUS MATERIAL INCIDENT

Upon receiving notification of a suspected Hazardous Material Incident:

35.2.1 RAIL OCC SUPERVISOR

1. After consultation with Metro Transit Police Department (MTPD) notify jurisdictional Fire and Rescue Services, Maintenance Operations Center (MOC) and Bus Operations Control Center (BOCC).

   Call to Fire Department should be done in plain language and addressed as a HAZMAT incident.

2. Immediately shut down all ventilation fans and notify personnel to close all air vents affected in underground station(s).

3. Instruct Train Operators reference 35.3, 35.4, and 35.5.

4. Establish initial hot zone of 1500 feet in all directions and secure WMATA personnel in a safe location(s).

Special ORDER 01-04 Page 1 of 4

a. WMATA personnel outside the 1500 foot zone should be ordered to keep out of the zone.

5. Appoint an interim On-Scene Commander and direct him/her to remain in the "Safe Zone" established by MTPD.

a. OCC should advise the On-Scene Commander to ensure 35.2.5.

35.2.2 PASSENGER OPERATIONS

1. Notify Station Manager.

2. Initiate passenger and employee evacuation announcements for the incident and adjacent affected station(s).

3. Contact personnel on WMATA Emergency Call List.

4. OCC will activate the Passenger Information Display System

35.2.3 METRO TRANSIT POLICE DEPARTMENT (MTPD)

1. Refer to General Order 368.

35.2.4 MAINTENANCE OPERATION CENTER (MOC)

1. Instruct field personnel, not in hazard zone, to remain in to a safe zone.

2. Account for all personnel working in wayside locations.

35.2.5 STATION MANAGER

Simultaneously, the Station Manager(s) of the affected stations shall begin the orderly evacuation of the station and should also move to safe zone.

1. Evacuate the station, verbally warning those in the station by the PA system and PIDS to evacuate.

2. The station fare gates will be opened, elevator will be put into override and entrance escalators will be turned off.

3. Lead people at least 1500 feet away from the station entrance(s), vent shafts, fan shafts and emergency exits.

4. Report to On-Scene Commander or MTPD the approximate number of people still in the incident station if known, and their condition.

5. Inform passengers not to leave scene until cleared by Incident Command and stay immediately outside 1500 feet safe parameter.

35.2.6 ON-SCENE COMMANDER (OSC)

MTPD is designated as the lead WMATA department for coordinating the mitigation of any Chem/bio incident. If no MTPD representative is present at the initiation of a chem/bio incident, the first - MTPD officer to arrive will assume on-scene command duties immediately upon arrival at the incident scene.

35.3 HAZARDOUS MATERIAL ON TRAIN

When a incident is reported on an identified train, OCC will:

Train in Tunnel/or Outdoors

1. Stop train.
2. Shut down HVAC and proceed in manual at 5 mph.
3. Order Evacuation of next station.
4. Stop short of next station.
5. **Never move an above ground incident train underground. Stop incident train in place and await emergency response personnel**
6. Enter station in manual at 5 mph when it is safe to do so.
7. Evacuate train into station, close doors and secure train.
8. Direct passengers to remain in station location other than platform.
9. OCC will instruct Train Operators approaching the station on the adjacent track to stop outside the station, shut down HVAC and await instructions to reverse and proceed to the previous station. If train movement is in the underground portion of the system, this should be at speeds no greater than 5 mph.

35.4 HAZARDOUS MATERIAL ON RIGHT-OF-WAY

1. Stop train traffic in both directions. Shut down HVAC.
2. Shut down tunnel ventilation.
3. Ensure compliance with 35.2.5.
4. Reverse trains to closest non-affected station not to exceed 5 mph and evacuate.
5. Evacuate station and direct passengers to remain until cleared by Incident Commander (IC).

35.5 SPECIAL CIRCUMSTANCES

1. Trains entering simultaneously with the report of a release in the station shall be ordered to proceed without a door cycle to the next station and follow instructions in 35.3.
2. When a Chem/bio agent is reported on the right-of-way, RAIL OCC will order Train Operators on both tracks to stop their trains prior to reaching the affected area, disable HVAC and await further instructions.

35.6 DECONTAMINATION

1. Await Fire Department and MTPD instructions.

35.7 DEFINITIONS

1. Weapons of Mass Destruction (WMD) are nuclear, biological and chemical weapons that were developed to kill, incapacitate or injure personnel, animals and/or plant life in military applications.

2. Nuclear Weapons of Mass Destruction are those weapons capable of nuclear detonation or release of radioactive isotopes to create a contaminated scene.

3. Biological Weapons of Mass Destruction (BW) are those weapons capable of being released to produce incapacitating or lethal disease. The effects of Biological Weapons may not be discovered for hours or days after their release.

4. Chemical Weapons of Mass Destruction (CW) are those liquid, aerosol or vapor chemical agent weapons which, if absorbed through the skin or lungs are capable of injuring, incapacitating or killing humans in large numbers.

5. Hot Zone is that area or suspected area that is contaminated by nuclear, biological or chemical agents and should NOT be entered by personnel unless they are fully protected, trained and equipped .

6. Safe Zone is an area that has been determined to be free of secondary devices and out of the hazardous zone, clear of any station entrance, escalator, elevator, vent shaft, emergency exit where dangerous fumes may escape to the atmosphere. If practical, a Safe Zone should be up-wind at least 1,500 feet from any point of danger.

7. Personal Protective Equipment (PPE) is equipment or gear designed for protective use in environments contaminated by WMD. Ordinary industrial protective equipment, in most cases, will NOT protect its user from personal contamination by WMD agents.

8. HVAC is rail vehicle or station heating, ventilation and air conditioning system.

Recommended:
Aubrey Burton
General Superintendent
Rail Transportation

Concur:
Fred C. Goodine
Chief Safety Officer
Office of Safety

Approved:
Lemuel M. Proctor
Chief Operating Officer
for Rail Service

Approved:
James T. Gallagher
Assistant Deputy General
Manager for Operations

Washington Metropolitan Area Transit Authority

SPECIAL ORDER

NO. 01-05 **DATE:** October 18, 2001

TO: RAIL - OCC

SPECIAL ORDER 01-05

This Special Order creates SOP #36 titled "UNKNOWN SUBSTANCE RESPONSE PROCEDURE"

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

INTERIM SOP #36 - UNKNOWN SUBSTANCE RESPONSE PROCEDURE

36.1 DESCRIPTION

This procedure addresses a release or spill which presents no adverse health symptoms, no smell, no perceived or obvious threat, no evidence of tampering, and not located or positioned in a manner that indicates an attempt to conceal its presence. Upon OCC or MTPD receiving notice of a unknown substance found in a station, train, wayside, or WMATA transit facilities this procedure will be followed.

36.2 NOTIFICATION OF A UNKNOWN SUBSTANCE RESPONSE

Upon receiving notification of an unknown substance:

Rail OCC Supervisor:

1. Notify Metro Transit Police Department (MTPD), jurisdictional Fire and Rescue Services, Maintenance Operations Center (MOC) and Bus Operations Control Center (BOCC).

   Call to Fire Department should be done in plain language and addressed as an unknown substance.

2. Immediately shut down all ventilation fans and notify personnel to close all air vents in affected underground station(s).

3. Instruct Train Operators reference SOP 36.4, 36.5, and 36.6.

Passenger Operations:

1. Notify Station Manager.
2. Contact personnel on WMATA Emergency Call List.
3. OCC will activate the Passenger Information Display System

Maintenance Operation Center (MOC):

1. Instruct field personnel to move to a safe area.
2. Account for all personnel.

Station Manager:

Reference 36.4 - 5.

36.3 ON-SCENE COMMANDER (OSC)

MTPD is designated as the lead WMATA department for coordinating the mitigation of any unknown substance incident. If no MTPD representative is present at the initiation of a unknown substance incident, the first - MTPD officer to arrive will assume on-scene command duties immediately upon arrival at the incident scene.

36.4 UNKNOWN SUBSTANCE ON TRAIN

When an unknown substance incident is reported on an identified train, OCC will:

Train in Tunnel/or Outdoors

1. Stop the train at the nearest station, offload customers.
2. Shut down HVAC.
3. Proceed to nearest yard.
4. Train operator shall provide estimated head count to OCC of customers on the affected train.
5. Station manager should ascertain all personal information of customers who were off-loaded from the train.

36.5 UNKNOWN SUBSTANCE ON RIGHT-OF-WAY

1. Stop train traffic in both directions. Shut down HVAC
2. Shut down tunnel ventilation.
3. Single track trains around affected area, not to exceed 5 mph.

36.6 UNKNOWN SUBSTANCE IN THE STATION

1. On Platform - Discontinue service to station. Continue 5 mph through station, request shuttle bus service. Isolate affected area.

2. Mezzanine Area - Close entrance to station. Continue 5 mph through station, request shuttle bus service when necessary.

36.7 DEFINITIONS

1. Safe Zone is an area that has been determined to be free of secondary devices and out of the hazardous zone, clear of any station entrance, escalator, elevator, vent shaft, emergency exit where dangerous fumes may escape to the atmosphere. If practical, a Safe Zone should be up-wind at least 1,500 feet from any point of danger.

2. HVAC is rail vehicle or station heating, ventilation and air conditioning system.

3. Unknown Substance - release or spill which presents no adverse health symptoms, no smell, no perceived or obvious threat, no evidence of tampering, and not located or positioned in a manner that indicates an attempt to conceal its presence.

Recommended:
Aubrey Burton
General Superintendent
Rail Transportation

Approved:
Lemuel M. Proctor
Chief Operating Officer
for Rail Service

Concur:
Fred C. Goodine
Chief Safety Officer
Office of Safety

Approved:
James T. Gallagher
Assistant Deputy General
Manager for Operations

APPENDIX D – Quick Reference Guides

Fire and Rescue Departments of Northern Virginia
FIREFIGHTING AND EMERGENCY OPERATIONS
METRORAIL

QUICK REFERENCE GUIDE

EMERGENCY MEDICAL SERVICES
ALS/BLS

Step#				
1	RESPOND TO ACCESS POINT	Meet with Metro official		
2	Determine patient(s) location	If patient in on train		
3		No suspected C-spine issues	Remove from train immediately	Release train
4		C-spine issues	Hold train, treat for C-spine	
5	If on platform/mezzanine	Treat for complaint		
6	If in right-of-way	Notify OCC and call for additional resources	Do not enter right-of-way without confirmation of third rail de-energized and WSAD in place	
7	CONTACT OCC 202-962-1970 202-962-1652			

Fire and Rescue Departments of Northern Virginia
FIREFIGHTING AND EMERGENCY OPERATIONS
METRORAIL

QUICK REFERENCE GUIDE

EMERGENCY MEDICAL SERVICE
MASS CASUALTY

Step #1	Respond to access point	Meet with Metro official	Determine patient location(s)	
2	Determine if incident is the result of a chem./bio/hazmat incident	If yes, withdraw and call for immediate assistance	Proceed to staging area	
3		If no, quickly determine the number of patients	Call for EMS task force(s) or additional units	Start triage
4	If patients are on train	Hold train, start triage		
5	If patients are on platform/mezzanine	Start triage		
6	If patients are in right-of-way	Notify OCC and call for additional resources	Do not enter right-of-way without confirming third rail de-energized and WSAD in place	
7	CONTACT OCC 202-962-1970 202-962-1652			

Fire and Rescue Departments of Northern Virginia
FIREFIGHTING AND EMERGENCY OPERATIONS
METRORAIL

QUICK REFERENCE GUIDE

SCENE SAFETY
FLAGGING

Step# 1	Determine the distance required from incident	750 feet for Metro, up to 2 miles for other railroads		
2	Determine person reporting to and radio channel	Report to command, operations, or safety	Use wayside phones or radios for contact	
3	Proceed to flagging position	Equipment required	Hand light, reflective gear, radio, flares	Position outside of rails in safe zone
4	If vehicle approaches on rails	Contact command	Face oncoming traffic	Wave light or flare from side to side continuously
5	If unable to remain at flagging position	Place a lit flare in center of track and return to incident	Insure flare is not in a position to cause fires	
6	CONTACT OCC 202-962-1970 202-962-1652			

Fire and Rescue Departments of Northern Virginia
FIREFIGHTING AND EMERGENCY OPERATIONS
METRORAIL
QUICK REFERENCE GUIDE

SMOKE/FIRE ON TRAIN

Step # 1	Meet with Metro official	Determine location of train		
2	If in station	Remove third rail power for track holding train	Call OCC and request power removal if center track/side platform, remove power to both tracks	Install WSAD
3		Determine location of fire	Train may need to be moved to access fire	If using passenger cars to move affected car, third rail must be energized
4		Extinguish fire	If small use portable extinguishers	
5			If large, use ample water	Do not direct water toward third rail
6	If train is not in station	Remove third rail power for track holding train	Call OCC request power removal from both tracks if necessary	Install WSAD
7		Determine location of fire		
8		Extinguish fire	If small use portable extinguishers	
9			If large, use ample water	Do not direct water toward third rail
10	CONTACT OCC 202-962-1970 202-962-1652			

Fire and Rescue Departments of Northern Virginia
FIREFIGHTING AND EMERGENCY OPERATIONS
METRORAIL

QUICK REFERENCE GUIDE

ELEVATOR/INCLINATOR RESCUE

Step # 1	Meet with Metro Official	Determine location of Elevator/ Inclinator	If elevator mechanic is not on scene, contact OCC for ETA	
2	Confer with elevator mechanic when they arrive			
3	Located Elevator Control Room	Remove power from affected unit	Establish communication with occupants	
4			Determine if injuries/illness present	If yes, request appropriate assistance
5	If drifting is required	Establish communications with crew at unit	Use metering valve to drift unit	
6		Open doors and remove occupants		
7	If drifting not option	Lockout power to unit	Determine best means to access unit	Open doors and remove occupants
8	Leave unit out of service			
9	CONTACT OCC 202-962-1970 202-962-1652			

Fire and Rescue Departments of Northern Virginia
FIREFIGHTING AND EMERGENCY OPERATIONS
METRORAIL

QUICK REFERENCE GUIDE

RESCUE FROM ESCALATOR

Step # 1	Meet with Metro Official	Determine location of unit	If mechanic is not on scene, Contact OCC for ETA
2	Stop escalator if still running	Use key, stop button	
3	Locate and disconnect main power		
4	If entrapment is life threatening	Strike step/comb plate near victim	Remove steps/ plates to free victim
5			Perform necessary first aid
6	If entrapment is not life threatening	Unscrew step/ comb plate at point of impingement	
7	Leave unit out of service	Use fire line tape if necessary	
8	CONTACT OCC 202-962-1970 202-962-1652		

Fire and Rescue Departments of Northern Virginia
FIREFIGHTING AND EMERGENCY OPERATIONS
METRORAIL

QUICK REFERENCE GUIDE

RESCUE FROM UNDER TRAIN

Step # 1	Meet with Metro Official	Confirm removal of third rail power	Place WSAD	
2	Confirm location of victim	Determine status of victim	If deceased	Stop FD operations and turn over to PD
3			If viable without impingement	Proceed with victim removal
4			If viable with impingement	Proceed with rail car lift
5	CONTACT OCC 202-962-1970 202-962-1652			

Fire and Rescue Departments of Northern Virginia
FIREFIGHTING AND EMERGENCY OPERATIONS
METRORAIL

QUICK REFERENCE GUIDE

RESCUE FROM BETWEEN TRAIN AND PLATFORM

Step #				
1	Meet with Metro Official	Determine if patient is viable	Insure that the rail car brakes are set	Insure that the third rail is down Place WSAD
2	If patient is deceased	No further FD action required	Turn incident over to PD	
3	If patient is viable	Determine type of impingement	Insure that personnel are in the proper positions	
4		If limb Impinged	Proceed with lateral jacking	Provide aggressive first aid
5		If torso is impinged	Remove all non-essential personnel and onlookers including media from area	Proceed with lateral jacking
6				Provide aggressive first aid
7	CONTACT OCC 202-962-1970 202-962-1652			

Fire and Rescue Departments of Northern Virginia
FIREFIGHTING AND EMERGENCY OPERATIONS
METRORAIL

QUICK REFERENCE GUIDE

RESCUE/RECOVERY/RECON TRAIN

Step # 1	Meet with metro official	Determine location of incident	Determine type of incident	Determine if train is needed as a resource
2	If rescue train is needed	This train is used to remove passengers from train involved in an emergency	Movement of this train under the control of the incident commander	Requires energized third rail
3	If recovery train is needed	This train is used to remove disabled train	Requires energized third rail	Disabled train will be moved to location safe for passengers to disembark
4	If recon train is needed	This train is used for FD to ride to incident location	May be used as rescue train once FD has reached the incident	Requires energized third rail
5	CONTACT OCC 202-962-1970 202-962-1652			

Fire and Rescue Departments of Northern Virginia
FIREFIGHTING AND EMERGENCY OPERATIONS
METRORAIL

QUICK REFERENCE GUIDE

WSAD INSTALLATION

Step # 1	Determine location of incident	Contact OCC and Request third rail power removed	Unit must be placed between 50 and 500 feet of incident and on third rail that runs through incident	Test unit strobe light Test unit warning siren
2	Test third rail with volt probe or hot stick to ensure power removed	Extend cables for both paddles	Place unit upright between running rail and third rail	
3	Attach white paddle to running rail	If good connection, indicator light will turn on	If no, indicator light	Remove paddle, scrape rail clean of rust and re-install
4	Attach red paddle to third rail	If good connection, indicator light will turn on	If no indicator light	Remove paddle and re-install short distance away DO NOT SCRAPE THIRD RAIL
5	If both indicators lights turn on, lay on its back with siren facing incident	If siren, strobe or both activate during any step of installation	Remove unit Either batteries are low, installation not in correct order, or the third rail is energized	

Fire and Rescue Departments of Northern Virginia
FIREFIGHTING AND EMERGENCY OPERATIONS
METRORAIL

QUICK REFERENCE GUIDE

TESTING THIRD RAIL

Step # 1	Meet with metro official	Determine location of incident	Contact OCC and request power removal	
2	Use either hot stick or volt probe with phenolic rod attached	Test tester in known electrical source	If no source available, use two to test third rail	
3		Place the ground lead on the running rail	Place the third rail lead on the third rail	If any lights turn on, third rail is energized
4		Remove the third rail lead from the third rail	Remove the ground lead from the running rail	Retest unit in a known electrical source
5	Report to command that third rail power is confirmed removed by volt probe or hot stick test			
6	CONTACT OCC 202-962-1970 202-962-1652			

APPENDIX E – REFERENCES

The following documents were used in the creation of this manual and can be referenced by fire and emergency service personnel for additional information about Metrorail.

- Washington Metropolitan Area Transit Authority, Emergency Services Manual, June 2001
- Washington Metropolitan Area Transit Authority, Train-the- Trainer Manual, November 1998
- Fairfax County Fire and Rescue Department Communications Manual, September 2000
- Metrorail Transit-Fire and Rescue Emergency Procedures Policy Agreement, May 1997
- Metrorail Emergency Response Maps, Book 3, 1997
- Alexandria Fire Department, Metrorail Operations
- Arlington County Fire Department, Communications Manual
- Washington Metropolitan Area Transit Authority, Standard Operating Procedures, various
- Washington Metropolitan Area Transit Authority, Special Order Bulletin, various